
THE CLINICAL and PATHOLOGICAL FEATURES
of
HYDRO - PYO - and HAEMATO - SALPINX.

being

A Thesis for the degree of M.D.

by

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THE CLINICAL and PATHOLOGICAL FEATURES of
HYDRO - PYO - and HAEMATO-SALPINX.

PREFACE.

In recent years perhaps on no part of the genital tract has so much interest centred as on the Fallopian tubes. Their minute structure, their normal function, their relation to menstruation, and the numerous pathological conditions to which they are subject have all occupied the special attention of many observers.

During the time I have acted as clinical clerk in Ward 28, Royal Infirmary, and as private assistant to Dr. Halliday Croom, I have had an opportunity of studying the various diseases of the uterine appendages.

The task which I have, therefore, set myself is to discuss in the pages which follow the clinical and pathological features of salpingitis, with special reference to three forms of tubal dilatation hydro-pyo - and haemato-salpinx.

I am especially indebted to Dr. Croom for permission to refer to the cases taken from Ward 28. and to those which I have seen in private.

It may be well, in the first instance, to state briefly the most commonly accepted view of the normal structure and physiology of the Fallopian tubes.

ANATOMY of FALLOPIAN TUBES.

The Fallopian tubes spring from the upper angles of the uterus, one on either side, their point of attachment being just behind that of the round ligaments. Each tube when straightened is about 10 c.m. long and occasionally one is rather longer than the other. At the uterine end, or isthmus, the lumen is just sufficient to allow the passage of a bristle, the thickness of the whole tube being from 2 to 4 c.m. but as it passes outwards it gradually expands so that the outer segment, or ampulla, varies from 7 to 10 c.m. The thickness of the walls of the tubes varies inversely with the size of the lumen. Each tube, at its isthmus is directed slightly upwards, and then passing between the layers of the broad ligament, where it occupies the upper free border, it is directed in a more or less

tortuous manner outwards, backwards and downwards, curling round the ovary so that the ostium is then turned upwards and the fimbriae come into immediate contact with the gland.

The walls of the Fallopian tubes are formed of a muscularis of unstriated muscular fibres. These are continuous with the muscular coat of the uterus and are arranged in two layers, an outer longitudinal and an inner circular. On two thirds of its circumference the tube is covered by peritoneum and between this and the muscular coat a loose connective tissue intervenes. The mucous membrane lining the lumen of the tube is covered with ciliated columnar epithelium and is arranged in longitudinal folds especially towards the distal extremity where they increase in thickness and divide becoming continuous with the fimbriae.

The framework of the mucous membrane consists of delicate connective tissue and in this fine strands of muscular tissue may be detected near the base of the epithelium. In the middle of a fold are many capillaries. (Plate 2.)

It is stated by the majority of authorities that the

Fallopian tubes are devoid of glands but Bland Sutton (1), by references to comparative anatomy, advances arguments to show that the folds in the tubal mucous membrane are really glands which secrete an albuminous fluid for the ovum. There is no doubt as to the structure but the interpretation by different authorities varies. The lumen of the Fallopian tube communicates with the peritoneal cavity through the ostium abdominale which is surrounded by the fringed portion, fimbriated extremity, or infundibulum. These fimbriae, which vary in number and degree of development, have been shown by Richard and Doran (2) to represent luxuriant folds of mucous membrane projecting beyond the tube. (Plate 3.)

Running between the ovarian border of the ostium and the ovary is the tubo-ovarian ligament in which is a longitudinal furrow. Accessory ostia have been described by especially Richard and Doran (3). Small stalked cysts, the cysts of Morgagni, are sometimes found attached to the fimbriae. These have been carefully investigated and described by Ballantyne and Williams (4) of Edinburgh.

FUNCTION of the FALLOPIAN TUBES.

The function of the Fallopian tube, or oviduct, is to transmit from the ovary to the uterus the ovum which is expelled at each period. During menstruation the Fallopian tube is markedly injected, the lining membrane becomes very vascular and free secretion occurs; the fimbriated extremity becomes closely opposed to the ovary so as to receive the ovum. By the majority of authorities ovulation and menstruation are supposed to be closely related, the first being the cause of the second but the point has been disputed by many. Lawson Tait (5) even holds that the origin of menstruation is in the Fallopian tube and argues that if the tube be removed menstruation generally ceases; if it does not, then a portion of the tube has been left. Jennings, however, has shown that if the tubes are removed and the ovary is left menstruation continues but if the ovaries are removed completely the menstrual flow ceases. Further, Professor Simpson (6) points out that, in the cases where Tait found a ripe ovum or recent corpus luteum between the menstrual periods,

the abdomen was opened owing to some pathological condition of the uterine appendages and hence such abnormalities of ovulation might be accounted for. It has also been said that menstruation is intimately connected with a special nerve which runs below the Fallopian tube and if this is cut then the periodic discharge ceases.

Dr. Martin (18) of Birmingham, in a recent paper, advances the theory that menstruation is directly connected with a special nerve centre which he locates in the lumbar enlargement of the spinal cord. This is connected with the uterus and its annexa by means of 'the menstrual nerves' which run in the pelvic splanchnics or the ovarian plexus, possibly both.

Martin believes that cessation of the menstrual flow after removal of the appendages is due to the severing of these nerves.

Much doubt therefore exists as to the true cause of menstruation and as to the real function of the Fallopian tubes.

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PART I.

SALPINGITIS.

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Before describing hydro - pyo - and haemato - salpinx it will be necessary to discuss in some detail a condition which so frequently predisposes and leads to the cystic dilatation of the Fallopian tubes, viz. Salpingitis.

SALPINGITIS.

Pozzi (7) in his recent work on Gynecology, classifies salpingitis into two great varieties,

- (1) those cases which form distinct cystic tumours and
- (2) those which are non-cystic. The first group includes hydro- pyo- and haemato-salpinx.

There is no doubt, however, that many cases of cystic dilatation of the Fallopian tubes are not, at least primarily, forms of salpingitis and whatever inflammatory changes occur are secondary to the presence of a pre-existing cystic swelling. These tubal dilatations, in some instances, correspond to retention cysts being the result of an obstruction in one or other part of the tube or, as in the case of haemato-

salpinx, the cyst may be the result of a tubal apoplexy, which is not necessarily inflammatory.

The forms of non-cystic salpingitis as described by Pozzi are

- (1) The acute catarrhal
- (2) The acute purulent
- (3) Chronic parenchymatous

These are all closely allied, the one being readily transformed into the other. A case commencing as acute catarrhal may after a time become purulent and this is commonly associated with an inflammatory condition of the parenchyma of the tube.

Further, it is evident that if from any cause the outflow of the hyper-secreted inflammatory fluid, be it mucus, serum, pus or blood, be either gradually or suddenly obstructed, a case of non-cystic may rapidly become one of cystic salpingitis.

There is also a close intimacy between the three forms of tubal dilatation, the one, as will be seen later on, assuming the character of the other.

Case I. The first marked case of Salpingitis which I had an opportunity of observing came under my notice while House Surgeon in the Royal Maternity Hospital, Edinburgh, in 1889. I am indebted to Professor Simpson for allowing me to record the case.

M. B. aet. 18, a primipara, unmarried, was admitted from the Royal Infirmary to the Maternity Hospital on November 24th. 1889 at 1. 30. a.m. Labour had been somewhat precipitate as she said the pains began at midnight and on admission it was found that the child was all but born; the head only had to be delivered by Smellie's grasp, the case being a breech presentation. The child, full term, was still born but after 15 minutes, attempts to resuscitate it proved successful. The placenta followed the birth of the child in about ten minutes. There was a slight tear in the vagina which was carefully stitched.

Previous history. The patient had been in the Infirmary for ten weeks under treatment for a chronic affection of the left knee joint which had been diagnosed as Gonorrhoeal Rheumatism. She was very reserved and, although closely questioned, no definite history

of an acute attack of gonorrhoea could be got from her. She had, however, during the past month complained of pain in the right iliac region, and during her stay in the Royal Infirmary she had frequently, but irregularly, rises of temperature reaching at times 103° with corresponding increase of the pulse rate, this notwithstanding that the condition of her knee was improving.

On the morning of delivery at 10 a.m. the patient complained of pelvic pain, pulse 102. temp. 100.4 .

At 7 p.m. she was easier pulse 94. temp. 100.

On Nov. 25th. at 10 a.m. pulse 90. temp. 98.

at 7 p.m. " 96. " 99.

Bowels moved freely, patient felt fairly well.

On Nov. 26th. at 10 a.m. patient looked better than any time since admission, pulse 86. temp. 98.8 .

Lochia perfectly sweet. At noon however, she had a rigor after which temp. rose to 103 . Pulse 114.

She then complained of pain in the right Iliac region where there was marked tenderness on pressure. The uterus was washed out with 1 to 4000 Corrosive Sublimate solution. Quinine, Digitalis, and Brandy were

ordered and hot fomentations locally.

Nov. 27th. at 10 a.m. pulse 120. temp. 102.

at 8 p.m. pulse 124. temp. 102. 8.

The uterus was again washed out but this caused a good deal of pain. Per vaginam a distinct fulness and great tenderness was made out to the right and behind the uterus.

Nov. 28th. at 10 a.m. pulse 112. temp. 102.

Pain in the right Iliac region worse; there was slight abdominal distension, the hot fomentations were replaced by the ice bag and gr. 1 of opium every six hours ordered.

At 8. p.m. pulse 120. temp. 103. 4.

The distension of the abdomen was more marked, lochia quite sweet.

Nov. 29th. at 10 a.m. the patient complained of great abdominal pain, the distension had increased considerably, the condition being now one of diffuse peritonitis. Her face was flushed and pinched. Temp. 102.6.

Pulse 123. small and wiry; tendency to sickness.

Towards night the patient got worse, temp. at 8 p.m.

being 103. 6. pulse 134.

Nov. 30th. at 9 a.m. pulse 140. temp. 103. 8. distension more marked; patient much weaker. At 11 a.m. Professor Simpson assisted by Dr. Berry Hart opened the abdomen and freely irrigated the peritoneal cavity with boiled warm water. The peritoneum was acutely inflamed, a flaky deposit of lymph being present in parts. The right Fallopian tube was much thickened and deeply injected, the left tube was similarly affected, but to a much less extent. The right Fallopian tube was adherent to the posterior uterine wall by organised bands of lymph and around it and in the pouch of Douglas there ^{were} ~~was~~ about 3 ounces of blood-stained purulent fluid. After the peritoneal cavity had been thoroughly irrigated a drainage tube was inserted and the wound dressed. The patient was very collapsed after the operation but in a few hours she improved wonderfully. The temperature, however, continued at 102. pulse 132.

On Dec. 1st. at 10 a.m. the patient looked better than she had done for days, temp. 102. pulse 120.

Towards evening, however, she became much worse and sank somewhat rapidly, dying on Dec. 2nd. at 3 a.m.

Permission was obtained for a post-mortem examination of the pelvic organs. This Dr. Fraser Wright kindly undertook. There was great matting together of all the pelvic organs due to the peritonitis. The right tube was enlarged, thickened and closely adherent to the uterus. The inflammation was not nearly so marked on the left side. Only a little pus was found in the lumen of the right tube. The uterus, but for the peritonitis, was otherwise normal.

The condition present seemed to verify the diagnosis that had been made before the operation viz. that there had been a condition of Gonorrhoeal purulent salpingitis especially on the right side, that during labour, or shortly after, some pus had escaped into the abdominal cavity which set up a local peritonitis and this later, becoming general, had caused the death of the patient.

The above is a history typical of a very usual course of the worst form of salpingitis - purulent gonorrhoeal. Fortunately, there are milder forms which one sees in the ward and in the out patient room

every day. There are even cases where the inflammation does not pass beyond the first or catarrhal stage.

NON-CYSTIC SALPINGITIS.

Aetiology:

In the vast majority of cases inflammatory conditions of the appendages are the result of inflammation extending upwards from the uterus.

Dalché (8) and Prochownick (9) endeavour to show that inflammation of the tubes and ovaries is possible without any pre-existing lesion of the uterus, but on the other hand Schröder (10) considers that continuity of tissue with the mucous membrane of the uterus is the only means of infection and in this view he is supported by the great majority of authorities.

J. L. Championnière (11) pointed out the important lymphatic connexions which exist between the uterus and its appendages and, from the fact that often the uterine extremity of the tube is but little affected

when the outer two thirds are greatly inflamed, concluded that the lymphatic channels were the most important means of communicating infection.

Pozzi (12) replies that the integrity of the uterine end is only apparent and that the microscope reveals changes which the naked eye cannot detect. Further, he points out as an analogy that frequently the kidney is infected from the bladder and yet the ureter may exhibit little or no change in its structure.

There is no doubt, however, that if an endometritis, be it ever so slight, continue for any length of time the tubes become also affected to a greater or less extent, so that the frequency of endometritis explains that of salpingitis.

Winckel (13) among 575 post-mortem examinations found 182 cases in which there was marked disease of the uterine appendages.

Case II. As one of many examples of inflammation of the appendages that might be quoted, the result of extension from the uterine mucosa the following case may be cited.

A. T. aet. 26 married 2 years, came as an out-

patient to Ward 28 on January 24th. 1893. complaining of leucorrhoea, of excessive menstrual flow and of some considerable dysmenorrhoea just before and during the two first days of the period. She had had one abortion six months before since when she had suffered from her present symptoms. Per vaginam, the os was normal but the uterus was enlarged. The passage of the sound which entered three inches caused considerable pain and on removal it was blood-stained. The appendages seemed normal. The condition was, therefore, one of endometritis and the patient was advised to remain in the hospital for treatment but this she could not do. After using the hot douche for a month she returned but the local condition was much as before. There were still neither symptoms nor signs of disease of the appendages. Three months later, however, she was admitted complaining of constant pain in especially the left side, severe premenstrual pain for three days, leucorrhoea, menorrhagia and dyspareunia. The tube and ovary on the left side were thickened and enlarged and the examination caused considerable pain. With rest, hot douching, ichthyol

packing and, some time after, curettage of the uterus she greatly improved so that all her symptoms almost entirely disappeared.

This then was a case in which the gradual spread of inflammatory changes from the endometrium to the Fallopian tube and ovary was very evident, and, probably, had the diseased mucous membrane of the uterus been curetted at first, the infection of the appendages might have been prevented.

Bland Sutton (14) has investigated, in monkeys and in women, a condition known as tubal catarrh associated with adenoma of the neck of the uterus. The mucous membrane of the tube becomes swollen and vascular, the normal secretion is much increased and on account of the tumidity of the mucous membrane at the uterine end the outflow is impeded. There is, therefore, a temporary distension of the tube giving rise to discomfort or even pain. The catarrh is often of a recurrent type and Bland Sutton believes that in very many cases, if not the direct result of, it is frequently associated with a condition of adenoma of the cervical glands. (Plates 4 & 5.)

Gonorrhoea is one of the most usual causes of salpingitis and according to Nöggerath (15) the most common cause of all.

Ricord and Reguin (17) first drew attention to the vast importance of gonorrhoea as a cause of inflammation of the Fallopian tubes and the results thereof. It is easily understood how a woman suffering from an acute attack of gonorrhoea may, owing to the advance of the poisonous virus, develop acute endometritis and salpingitis. There are many cases, however, where the cause, though gonorrhoeal in origin, is not so apparent, at least to the sufferers. The poison may remain latent for a lengthened period, even for years, in either the male or female genital tract, and only when stimulated it is roused into activity. Very frequently a man who has at one time or other contracted a gonorrhoea and considered himself absolutely cured or suffering merely from a slight and harmless gleet has, on marriage infected his wife with gonorrhoea, set up inflammatory disease of the uterine appendages and if he does not imperil the woman's life, especially on childbearing, (see case I.) at least converts her into

a chronic invalid. In many cases gonorrhoea seems to leave the vagina unaffected so that the usual discharge of vaginal origin is absent. The poison is communicated directly to the uterus whence to the tubes and ovaries the passage is easy.

The effects of gonorrhoea on the Fallopian tubes are very varied. The inflammation may never go beyond the catarrhal stage but on the other hand it very frequently becomes purulent, the pus becoming either encysted or not, and liable at any time to escape into the peritoneal cavity setting up severe and generally fatal peritonitis. Neisser's gonococcus is frequently found in such cases but not always so.

Wertheim (19) has demonstrated the presence of gonococci in the peritoneal exudation.

Orthman (18) pointed out that the coc^eus was found not in the wall of the tube but only in the pus.

Case III. to illustrate the effects of an acute attack of Gonorrhoea upon the Fallopian tubes.

Mrs. L. aet. 32 who had two children, the youngest

being two years old, I saw in private and found her suffering from an attack of gonorrhoea affecting the vulva, the vagina and the urethra. It appeared that while the patient was confined to bed for three weeks with an attack of bronchitis her husband had contracted from a prostitute a gonorrhoea which he afterwards transferred to his wife. In spite of active antiseptic measures the disease spread and before long, after several rigors, the patient began to complain of pain on pressure in the iliac regions as well as the usual symptoms of cystitis, and general ill health. The purulent secretion from the vulva and lower vagina had considerably abated but on bimanual examination there was excessive tenderness in the fornices and a distinct rounded fulness in the position of the Fallopian tubes. Under the usual treatment of rest, hot douching and vaginal packing the patient somewhat improved for a time but at each period subsequently her sufferings were extreme. After four months she had become so much worse that, at the patient's request, Dr. Croom removed the appendages, the inflammation of which had evidently become purulent.

I am able to show a drawing of one of the Fallopian tubes. ((Plate 6.))

This was a very marked case illustrating the rapid advance and disastrous results of acute gonorrhoea in the female. As a rule the effects are more slowly and gradually produced.

Post partum and post abortum infection is one of the commonest causes of inflammatory disease of the Fallopian tubes. This, as nearly all others are, is a septic form of salpingitis and especially liable to occur when a portion of the placenta is retained in utero. This retained debris becomes gangrenous, a condition of septic endometritis follows, and, if the cause is not speedily removed, the infection rapidly spreads to the Fallopian tubes.

Case IV. to illustrate post-partum salpingitis. Case II. illustrates the gradual onset of salpingo-ovaritis after an abortion but in some cases post-partum or post abortum infection of the annexa seems to be more direct and rapid.

Mrs. G. aet. 28 was delivered of her second child

in February 1890. She had always enjoyed good health and her previous labour and puerperium were perfectly normal. However, on the fourth day after her second confinement she had a slight rise of temperature (100. 5.) and she complained of pain in the left iliac region. From day to day this became worse until on the ninth it became so severe that it was considered necessary to make a pelvic examination. The lochia seemed natural, the uterus, though still large and heavy was normal but, to the left side, the ovary and tube were felt distinctly enlarged and very tender. The patient continued in statu quo for some days but after a fortnight the acute condition had yielded to treatment. Since that time, at the menstrual periods, the patient has suffered more or less from slight symptoms of an inflammatory affection of the uterine appendages as well as from occasional acute intermenstrual exacerbations of pain. The patient has had two children since 1890 and although, during her pregnancies, all her symptoms have disappeared, they have returned with renewed vigour after each labour. She is now under treatment, her last child having been born in

December 1893.

In this case the post-partum infection seems to have directly attacked especially the left tube and ovary. The uterus continues normal, there being no signs of endometritis and the patient has never complained of leucorrhoea.

Before the days of antiseptics, the various minor gynecological operations, even the passage of the sound, very commonly set up endometritis and inflammation of the appendages. Even now, one finds that, although the most strict antiseptic precautions are observed, some uteri cannot endure the slightest manipulation without inflammatory reaction. In other patients the pelvic organs seem to almost abnormally tolerant of surgical interference.

Case V. to illustrate the effects of a minor gynecological operation in causing salpingitis.

A. B. aet. 21 unmarried came as an out-patient to Ward 28. in April 1893 complaining of spasmodic dysmenorrhoea during the flow, so severe that for three days every month she was confined to bed and unable for her work.

On vaginal examination the os uteri was pin point in size, the uterus and appendages apparently normal. Various medicines were tried without beneficial effect and on July 2nd. the patient was admitted to the Ward. On July 7th. chloroform was administered and a series of bougies passed into the uterine cavity; finally the cervical canal was thoroughly dilated by Sim's dilator. Two days later the patient complained of considerable pain in the left side and on the fifth day, on examination, a marked thickening and tenderness could be made out in the fornix. A few days afterwards a distinct deposit could be felt bimanually on the left side, the examination causing severe pain. Under the usual treatment this gradually subsided to a great extent and the patient left the Ward on August 25th feeling well.

In this case the inflammation of and surrounding the appendage was no doubt due to the artificial dilatation of the cervix and apparently could not have been prevented. The annexa seemed healthy before the operation which was carried out with strict antiseptic precautions.

Winter (20) pointed out that the cervical canal normally contains organisms which are a constant source of infection and suggests that, when from stenosis or displacement, the normal drainage of the cervical mucus is interfered with, an auto-infection from reflux into the uterine cavity may thus be produced.

There are other but less important causes of salpingitis such as that produced by the influence of various eruptive fevers, especially scarlet fever and small-pox.

Lawson Tait (21) drew attention to these in relation to inflammation of the uterine appendages in a paper in the Brit. Med. Journal, April 16th. 1887.

Galliard (22) recorded a case in which salpingo-ovaritis with abscess in the ovary and subsequent peritonitis followed an attack of measles in a virgin of twenty one.

(Nouvelle Arch. d'Obst. et de Gyn. Supplement p.228.)

It has also been observed that the severe type of influenza which has visited this country during the past four years has a tendency to produce a condition of salpinge-ovaritis. In such a case it is difficult to

say whether the influenza acts as an exciting cause in a patient already predisposed to the condition or whether by lowering the general vitality, it causes a predisposition to catarrhal conditions of the uterine annexa, as it certainly does of other parts.

Rheumatic fever too sometimes is followed by an attack of salpingo-ovaritis.

SALPINGO-OVARITIS,
following Scarlet Fever.

Case VI. On September 25th 1891 I attended in Ventnor, Isle of Wight, Mrs. W. aet. 25 who was confined of her first child. Low forceps were applied and delivery was effected without difficulty. She had a perfectly natural puerperium until the eleventh day when she suddenly developed scarlet fever which was then prevalent in the town. Although dangerously ill for some days she ultimately recovered and at the end of six weeks was apparently well.

Three and a-half months after the date of deli-

very Mrs. W. menstruated, the discharge being somewhat excessive and attended by a considerable amount of pain. The following month, for some days before the period was due, she complained of somewhat severe pain in the ovarian regions. This was relieved by the onset of the flow which, however, was profuse and prolonged for seven days. At two subsequent menstrual epochs these symptoms were repeated but between times the patient, but for some slight occasional uneasiness in the iliac fossae, was quite well. There was no inter-menstrual leucorrhoea. On vaginal examination, there was marked tenderness in both fornices with enlargement of the tubes and ovaries. The patient was ordered rest, hot vaginal douches and ichthyol and glycerine dressings with the result that at subsequent periods premenstrual pain was considerably ameliorated and the discharge became not excessive.

This was then probably a case of salpingo-ovari-tis following scarlet fever. There is no doubt that the appendages were predisposed to an inflammatory condition by the process of parturition but I do not think that this was the exciting cause.

The placenta and membranes were removed entire and there were absolutely no signs of an accompanying endometritis.

Case VII. INFLUENZA and SALPINGITIS.

A. T. aet. 21 unmarried, had enjoyed the best of health till in March 1893 she was seized with a sharp attack of the severe type of influenza with all the now well recognised symptoms, severe pain in the back, acute frontal headache, the usual catarrhal symptoms of the eyes, nose, throat and bronchial tubes with general discomfort and high fever. Under treatment the acute symptoms gradually subsided by the end of a week leaving the patient, however, very weak and somewhat anaemic. Her strength returned only very slowly and she continued for some months listless and depressed. During this time too, at the menstrual periods, she complained of dysmenorrhoea and menorrhagia which seemed to ^{get} worse as time went on. At the end of five months the symptoms of some pelvic mischief had become so severe that the patient was anaesthetised

and a bimanual examination made. On each side of the uterus a slight but marked swollen condition of the Fallopian tubes and ovaries could be made out; the uterus seemed normal and there was no leucorrhoea. With rest, hot douching and vaginal ichthyol packing the constant pain in the iliac regions disappeared and at subsequent periods the symptoms were much relieved but even now (February 1894) the premenstrual dysmenorrhoea is considerable. Physical examination, however, reveals nothing abnormal in the pelvis.

In this case, therefore, the virus of Influenza, whatever it may be, seems to have directly attacked the uterine annexa setting up catarrhal salpingo-ovaritis the effects of which, a year after the first attack are still marked.

Monprofit (23) considers that some cases of salpingitis may be syphilitic but Pozzi remarks that they will not bear investigation.

Alban Doran (24) writes of a papillomatous sal-

pingitis and Ad. Zehman (25) of a salpingitis due to a condition of Actinomyces but these are mere curiosities.

In Zehman's case actinomycotic nodules were found in the walls of the right Fallopian tube which was considerably enlarged and adherent to surrounding parts. The tube had probably been infected with the disease per vaginam but it is also possible that it may have become infected from the alimentary canal through the loop of ileum to which the tube was adherent.

Tubercular inflammation of the Fallopian tubes has been observed. Frequently this is only one manifestation of general tuberculosis but occasionally it has been observed as an isolated condition. It is probably in many instances due to the introduction of tubercular semen but it has also been noticed in virgins, especially about the time of puberty. In these cases the tubes are probably already congested from some other cause and the tubercle conveyed through the blood, through the peritoneum, from the bowel or bladder, by fingers, instruments or linen, attacks them as a weak point of resistance. Indeed, salpingitis occurring about puberty is very rarely other than tubercular.

G. Percy Kidd, (26) G. Silcock, (27) Ballantyne and Williams (28) and others have recorded cases in which tubercle bacilli existed in the Fallopian tube but it has been noticed that in many undoubted cases of tubercle of the Fallopian tubes bacilli were absent or present in only very small numbers.

J. Whitridge Williams (29) in an exhaustive paper

on Tuberculosis of the Female Genital Apparatus remarks that although tubercular inflammation of the Fallopian tubes is generally secondary to tubercle elsewhere it is usually primary so far as the genital tract is concerned. He, however, demonstrates that it is the primary seat of tuberculosis more frequently than is commonly supposed.

Williams describes three forms of tubercular salpingitis (1) Miliary tuberculosis (2) chronic diffuse tuberculosis and (3) chronic fibroid tuberculosis.

The last is characterised by an excessive formation of fibrous tissue in and between the tubercles. It is very chronic and Williams suggests that it may be an indication of a healing process. He notes that genital tuberculosis is not infrequent. In 444 abdominal sections by different operators it was found in 15 or about 3.5 per cent. Out of 137 observed by Williams himself, in two the disease was evidently tubercular but in 5 others, where at first tubercle was not suspected, the microscope revealed the presence of tubercle bacilli, making 7 or 5.2 per cent. He, therefore, points out that no doubt very often the disease is not

recognised unless a systematic microscopical examination is made.

Tubercular salpingitis may occur at the age of 5. or as late as 40. The greater number of cases occur between the fourteenth and twenty-fifth year. The external appearances of a tube affected by tuberculosis resemble those of a pyosalpinx; it is twisted and distended and the lumen of the tube is tightly packed with caseous material. If this is removed the mucous membrane resembles the velvety lining of any chronic abscess cavity. In some cases the tubercle is found deposited in the walls. The abdominal ostium is generally closed. If not, the disease is especially liable to spread to the peritoneum from the escape of tubercular matter but it is also certain that even when the ostium is occluded tuberculosis of the tube, whether primary or secondary, is generally associated with tubercular peritonitis.

(30)
Dr. Wheaton has recorded a case in which a fatal local peritonitic abscess was found, the result of tubercular ulceration and perforation of the tube.

The microscopic appearances of tubercular salpingitis consist of a thickening of the serous and muscular coats of the tube, this being due to an infiltration of round cells. Here and there, small characteristic tubercle nodules are found. The structure of the mucous membrane is not recognisable, being either infiltrated by inflammatory products or destroyed by ulceration.

The signs of tubercular salpingitis are irregular menstruation or persistent amenorrhoea, sometimes profuse leucorrhoea along with the existence of an irregular swelling on each side of the uterus. In such a patient, if tuberculosis of the lungs is found, this would tend to strengthen the opinion that the pelvic lesion was also tubercular.

The diagnosis is always difficult and indeed the microscopic examination of removed parts reveals the only certain signs. Williams holds that amenorrhoea is not specially associated with tubercular salpingitis; if it does exist, it is due to an accompanying phthisis.

The Prognosis is grave as secondary infection of other organs is very liable to occur.

If primary tuberculosis of the Fallopian tubes be diagnosed the tubes should at once be removed. If, however, it is secondary and the lungs are diseased, the operation should be performed only if the mischief in the chest is early and likely to recover. If the peritoneum be affected abdominal section and removal of the appendages will do good. The results of such operations are fairly satisfactory. Cases are recorded in which the patients have been perfectly well four or five years afterwards.

Case VIII. There is at present in Ward 28. (November, 1893) a girl of 17 who has the general appearances of tuberculosis and was admitted complaining of abdominal distension. She has menstruated scantily and irregularly during the past two years but without any of the usual painful signs of salpingitis. The abdomen is markedly distended and there is evident matting of the intestines from chronic peritonitis. Per vaginam the uterus is normal but the os is pin

point in size and on each side there is a very palpable thickening of both tubes, especially of the left. The question arises whether this is not a case of primary tuberculosis of the Fallopian tubes with secondary infiltration of the peritoneum. The diagnosis at present is uncertain but the case is one of great interest.

March 4th. 1894. The abdomen of this girl was afterwards opened. A small amount of fluid was found in the peritoneal cavity and the peritoneum was studded with typical tubercle nodules. The tubes were thickened but were not removed.

Probst Anatomy

PATHOLOGY of SALPINGITIS.

The external surface of the Fallopian tube in acute catarrhal salpingitis is of a pinkish hue and is sometimes covered by fine false membranes which bind the tube to the ovary or adjacent structures. (Plate 9.)

The organ is swollen and very often convoluted owing to the fact that the lower border is bound down to the broad ligament. The fimbriated extremity is sometimes patulous but more often it is folded on itself. The interior of the tube is covered by the usual but hypertrophied folds of mucous membrane their real structure being obscured by the infiltration of hosts of cells of different sizes. (Plate 8.)

Bland Sutton had investigated the nature of these cells and determines three distinct forms, (1) cells with large nuclei with from 3 to 6 nucleoli and a small rim of unstained protoplasm. (2) Cells with a large elliptical nucleus resembling the epithelioid cells of tubercle. (3) The largest cells of all were nearly transparent with a nucleus small in proportion to the size of the surrounding protoplasm. These cells carry on

what Sutton calls an amoebic warfare with each other and with irritants such as micro-organisms.

In the lumen of the tube there is generally an excess of mucus or muco pus. Under the microscope the folds which are hypertrophied and club shaped are seen to be covered with newly formed vegetations. These frequently anastomose so that the section presents a network-like appearance. As a rule, the columnar ciliated cells are, at least in parts, destroyed, their place being taken by somewhat cubical cells without cilia, while the basis of the vegetations consist of embryonic cellular tissue. The muscular coat, to a certain, though limited extent, is also affected, there being a general hyperplasia of the muscular fibres.

When the inflammation becomes purulent the lumen of the Fallopian tube is filled with pus, the tube itself being much thickened even to the size of the index finger. The tissues which are soft and friable are greatly swollen. This thickening of the tube wall is in the majority of cases confined to the mucous and

submucous coats. The muscular coat rather tends to become attenuated. (Plate 22.)

The inflammatory action in this stage is so severe that the ostium abdominale is nearly always closed - a very fortunate protective process. The uterine end frequently remains permeable so that the pus may escape into the uterine cavity; if it be closed or at least obstructed by the swollen mucous membrane the pus is encysted and the condition becomes one of pyosalpinx which is, on the whole, more commonly found than the non-^{an}-cysted form of tubal suppuration.

Closure of the abdominal ostium, as shown by Doran (31) may be the result of pelvic peritonitis or of salpingitis. Due to the former cause it is the result of the formation of adhesions between the swollen agglutinated fimbriae and neighbouring organs such as the ovary, the uterus or the rectum.

Closure, the result of salpingitis, occurs differently. The fimbriae which are really mere protrusions of the tubal mucous membrane, when inflamed, hypertrophy and later, as the muscular coat becomes affected it elongates and bulges over the fimbriae.

As the muscular coat contracts and coheres round the fimbriae the opening assumes a rounded appearance and if this is slit up the fimbriae are found folded up within it.

As the tube enlarges and elongates, it burrows between the layers of the broad ligament and on account of its connection with the tubo-ovarian ligament and the mesosalpinx becomes markedly tortuous. Associated with this burrowing, an effusion of inflammatory products may or may not take place between the layers of the broad ligament.

In purulent salpingitis the mucous membrane is grayish and a section shows that the plicae are enormously hypertrophied and covered with vegetations which anastomose and give the appearance of glandular cavities. (Plate 13.)

The cilia are destroyed and the cells become cubical or flattened although they may be columnar in the sinuses. Inflammatory cells infiltrate the whole thickness of the wall. On dividing the ampulla of a purulent tube it will be found greatly thickened in

all its coats, the mucous membrane especially being much swollen. (Plate 17.)

Sometimes a purulent salpingitis may spontaneously be cured. The cocci of suppuration become exhausted and the acute action ceases. A process of chronic inflammation sets in which consists of an infiltration into all the coats of the tube of an embryonic connective tissue so that the tube becomes much enlarged, the condition being one of hypertrophic salpingitis. (Plates 12 & 25) The lumen of the tube is occupied by organised vegetations which are soft and pulpy. Later on the condition may become one of atrophic salpingitis in which the cellular elements are absorbed and a process of cicatricial contraction of the connective tissue takes place, the muscular fibres to a large extent disappearing and the tube being ultimately represented by a mere fibrous cord.

The ovary, when the inflammatory action is at all severe, generally shares in the process but into the various pathological changes which may take place in the ovary I do not propose to enter.

The pathological appearances of tubercular inflammation of the appendages have been described on a previous page.

SYMPTOMS of SALPINGITIS.

One of the most marked features is pain which varies in character. As a rule it is dull and aching in the iliac region but it may frequently shoot round to the lumbar region, up to the epigastrium and down the thighs. It is generally constantly present with frequent exacerbations but it may be more of an intermittent neuralgic character. Sometimes it is colicky and after a spasm of pain a discharge of pus per vaginam has been observed. Whether this pus comes from the tube itself and the pain is due to the effort of expelling it, or from the uterus which is reflexly stimulated to contraction is difficult to determine. Pressure in the iliac region causes discomfort and when the ovary and tube are manipulated bimanually the pain is very severe. Dysmenorrhoea is a marked symp-

tom and this has special features. It comes on some two or three days, or even a week before the appearance of the menstrual discharge, is very acute, and when the flow is established gradually passes off. In simple endometritis where the appendages are fairly healthy there is generally some premenstrual pain but as a rule for not more than one or, at the most, two days.

However, pain is not a constant symptom. Even with advanced catarrhal salpingitis there may be no acute suffering. It is generally only when the outer coats of the tube - and especially the peritonitic - are affected that the pelvic distress becomes severe.
(Cullingworth, 32)

Menorrhagia almost constantly is well marked in salpingo-ovaritis, the duration and amount of the flow being excessive. The only forms of inflammation of the Fallopian tubes in which one finds a diminution of the menstrual flow or actual amenorrhoea is either where the condition is one of atrophic salpingitis, the function of the organ being destroyed, or where the inflammation is tubercular, in which case amenorr-

hoea is not uncommon. The left is the ovary most frequently and, when both are, most severely affected. This is probably due partly to its proximity to the rectum and partly to the fact that the left side of the cervix is most commonly lacerated during labour so that inflammation spreads directly up the uterine cavity to the left Fallopian tube or the appendages are affected through the lymphatics on the left side.

With the patient on her left side, the usual position for examination in this country, the left ovary is not so easily palpated as the right so that the truth of the statement that the left ovary is more commonly affected is not at first sight apparent.

The presence of pus in the tube is suspected from the severity of the symptoms; occasionally, but with great difficulty, from the intermittent discharge of pus and especially when there is a history of gonorrhoea, recent or latent, as a causal agent.

Reflex symptoms, such as headache, vomiting and gastralgia are also met with but even in purulent salpingitis there is but seldom a rise of temperature.

The physical examination in an early case of sal-

pingitis may reveal little other than marked tenderness in the fornices but, when the inflammation has advanced to any extent or has become chronic, the tube becomes thickened and is easily felt lying to the side of or behind the uterus. It is the more readily palpated owing to the condition of peri-salpingitis which is a usual accompaniment, this adding considerably to the thickness of the organ. On abdominal examination an indefinite fulness or resistance can generally be made out in one or other ovarian regions. When very old-standing and the tube atrophied, it may be felt simply as a fixed fibrous cord.

In cases of chronic salpingitis there is often a history of gonorrhoea but more commonly of a difficult labour or an abortion with septic infection. Since then the patient has been sterile and suffered from premenstrual dysmenorrhoea, menorrhagia, dyspareunia and painful defaecation. In many cases the tubes and ovaries are most easily palpated per rectum and this the more readily if the uterus is drawn downwards by means of a volsellum.

Associated with salpingitis there are frequently signs not directly dependent on the condition of the tubes, e.g. the patient may complain of a vaginal discharge which is due to an accompanying endometritis. A patient suffering from salpingitis especially if purulent may suddenly be seized with severe local and later diffuse abdominal pain accompanied by rigors and a rise of temperature. This sudden exacerbation of symptoms indicates the onset of acute general peritonitis and is usually due to the escape of septic matter into the serous sac from an unclosed ostium. Occasionally the onset of peritonitis is more gradual and this occurs when the inflammatory process extends from the mucous membrane through the muscular coat to the serous covering. Many fatal cases of so called 'puerperal fever' are really deaths from general septic peritonitis following the escape of pus from the tube into the abdominal cavity. (see Case 1.) Barnes, Sutton, Vocke, Martin, Forster, Howitz, Tait and others have recorded such cases. Delbet (33) mentions that Sireday found in the course of twenty-nine autopsies upon women who had died during the puerperium no less than twenty-

two in whom the tubes were dilated, full of pus, and the ovaries purulent.

Sterility is not a necessary although a very common symptom of salpingitis. Unless the lumen of the tube is obliterated or obstructed fecundation is not impossible but, as a rule, the mucous lining of the tube is so destroyed that the passage of the ovum is not facilitated. There is, however, a great tendency to abortion although this is not so marked, even in gonorrhoeal salpingitis, as in syphilis. Indeed very frequently it is only post abortum or post partum that the disastrous results of gonorrhoea in the female are observed.

DIFFERENTIAL DIAGNOSIS.

The ovarian pain complained of by hysterical subjects has to be distinguished from that of salpingo-ovaritis. The former is neuralgic in character, accompanied by hysteria and is generally on the left

side. On slight pressure in the region of the left ovary an attack of hystero-epilepsy, with all the usual symptoms may be induced, whereas firmer pressure may abort or at least defer an attack.

Neuralgia of the abdominal wall has also to be distinguished but this is recognised by its superficial position.

Small ovarian cysts are not easily distinguished from hypertrophy of a tube. When an ovary becomes enlarged it at first prolapses and drags upon the broad ligament often giving rise to considerable distress, so that the pain from early ovarian tumour growth resembles that of salpingitis. On physical examination, too, a cystic ovary may simulate a distended tube. If firmly impacted between the uterus and the pelvis the ovary becomes flattened so that it feels tubular and sausage shaped. (see case 112.)

Similarly it is often impossible to diagnose salpingitis with distension of the tube from ^{other} forms of ovarian tumours and from small parovarian cysts.

A retroflexed fundus uteri, small uterine myomata, tumours of the pelvic bones, tumours in the broad

~~of~~ interference with the uterus which
often are supposed to come from
origin to the symphysis pubis. Tail,
however says he has never known a
pyosalpinx which could have been ascribed
~~to any of the~~ ^{to any of the} menorrhagia.

Mobil. records one which was the
result of typhoid fever. Pyosalpinx
has been found associated with fibroid
& malignant tumours of the uterus.
In the former case it is either a coincidence
or the result of occlusion of the uterine
end of the tube with subsequent suppuration
of the retained fluid: ~~as in the latter~~
it is the result of direct septic
infection & is not uncommonly
the immediate cause of death in cancer
of the uterus. ~~From~~ The records
of Middlesex Hospital indicate that
pyo & hydrosalpinx complicate uterine
cancer in the proportion of not
less than 10%.

A tubercular abscess of the tube can
be recognized only with the aid of the
microscope. Cancerous masses found in the
tube have been supposed to be characteristic
of tuberculosis but there might be merely

impissated pus can be pronounced
tubercular only when the typical follicle
is found. As a rule "cold abscess of the tube"
is associated with tuberculosis of neighboring
organs especially of the peritoneum. But this, of course,
~~materially~~ materially aids the diagnosis.
Koch's bacillus has occasionally been
found in the pus but even in undoubtedly
tubercular cases this is not always found
just as Neisser's micrococci are not always
abundant in gonorrhea. Tubercular inflammation
of the tubes is generally secondary to tubercle
elsewhere but as far as the genital tract
is concerned they are the first part of it.
It is affected & of the disease ^{in many cases} pus rises to
all the symptoms & signs of a pyosalpinx.

As to treatment, the great majority of
authorities recommend one and only one method
of treating a pyosalpinx, viz. removal of
the diseased appendages by abdominal section.
Walton is the first one - etc.

x * * * * *

Wackenhagen recommends a method of treatment
which is very much on the same lines as
Walton's when good results.

is intense inflammatory changes occurring within or without the tube itself.

In salpingitis may lead to not only a fortunate protective closure of the os uterini abdominal but also to an occlusion of the uterine end on account of the swelling & infiltration of the walls. As a rule only the outer two thirds of the tube are involved but occasionally the whole length is distended. The fimbriated extremity is usually involved but in a few cases it is found projecting free beyond the accumulation of fluid ~~below~~ the ampulla is absent & the ovary Very frequently the ovary is also transformed into an abscess cavity which may or may not communicate with the distended tube. If it does then the ^{case} ~~condition~~ is really one of salpingo-ovarian abscess. The ^{condition} ~~condition~~ ^{fulgid} ~~fulgid~~ ^{lead to the formation} ~~of a pyosalpinx~~ are those which set up purulent salpingitis plus an obstruction to the outflow. The exciting cause of the suppuration is gonorrhoeal or non-gonorrhoeal infection occurring post partum or especially post abortion. Some cases have been traced to surgical

Neuerthaler, Johannes v. d. d.

Pyosalpinx with three illustrative cases,

by
Hammes Lae R. M.D., F.R.C.P.

As far as my personal observation goes there are three distinct conditions in which pus is found in the Fallopian tubes (1) cases in which the lumen of the tube is not much dilated and the walls are thickened - purulent salpingitis (2) cases in which the lumen is dilated to some extent but the walls are still hypertrophied - an intermediate stage (3) cases in which the normal configuration of the tube is lost, the lumen being enormously dilated & the walls being atrophied and membranous - true pyosalpinx. The aetiology of pyosalpinx involves the question of the causation of tubal distension generally and in this connection Freund ~~points~~ laid stress on the fact that one of two forms of Fallopian tubes is found. There is one which is the normal - almost straight and of the usual calibre while the other is an imperfectly developed oviduct - being much

thrust with here & there a ^{lumen} necessary
diminished ~~lumen~~ in size. The latter is
the result of a continuance of the
infantile condition and in these cases
Fremont holds that cystic dilatations
are apt to occur owing to the convolutions
of the tube and the obstructions. the
lumen. It has also been shown that
another ~~cause~~ predisposing cause of ~~tubal~~ distension is found in the
During pregnancy the Fallopian tubes
like the uterus hypertrophy; they are
at full term from 6 to 8 inches long
and that this is not due to mere
elongation is shown by the fact that the
calibre is not diminished and the
individual fibres are enlarged to twice
their normal bulk. If after labour
the involution of the tube be imperfect or
twisting will be the result as the
loose attachment of the broad ligament
does not prevent it. Simple angulation
then even when the ~~tube~~ uterine end
is permeable may account for dilatation
of the tube ^{altho'} the cause may not be
always recognised as the exploring
probe or bough straightens the tube.
But the most common cause of obstruction
to the outflow of secretion is the ~~of~~ of ovulation.

incomplete
post partum
involution
of the tube.

ligament, and diseases of the vermiform appendix have all to be differentiated from a salpingitis.

It is not easy to determine which symptoms are due to the lesion of the tube and which to that of the ovary. When the one is inflamed the other nearly always is similarly affected. One can, at times, distinguish the enlarged rounded or cord-like tube distinct from the ovary but in many cases the matting of the organs is so intimate that the two parts cannot be separated and the swelling must be looked upon as tubo-ovarian.

COURSE and PROGNOSIS.

When salpingitis is established complete resolution is rare. If, however, the cause, such as an endometritis, be removed, the tissues may regain their power and in time by destroying the microbes resume an almost normal condition. Nevertheless, in the vast majority of cases the improvement from treatment is only temporary, the tube going generally from bad to worse until its function is destroyed. The condition becomes one of chronic salpingitis and the patient, on over exertion or from other causes, is liable at any time to acute exacerbations as also to attacks of pelvic peritonitis which Lawson Tait (34) considers are due to the escape of a few drops of pus into the peritoneal cavity. If the inflammation is so severe as to cause closure of the abdominal ostium and such swelling that the uterine end is also obstructed, a condition of either hydro- or pyosalpinx is liable to be produced.

TREATMENT.

The treatment of catarrhal salpingitis is much the same as that of all non suppurative pelvic inflammation. Absolute rest must be enjoined. The patient should have a hot vaginal douche at a temperature of about 118° for 1/2 an hour three times a day and every night an ichthyol and glycerine (10 per cent) vaginal dressing. Occasional blisters, cauterisation or application of leeches over the brim of the pelvis will have a beneficial effect. Hot hip baths are comforting and for the dysmenorrhoea which is usually very marked Bromides and the tinctures of Gelsemium and Henbane. The patient should have mild saline purgatives and, with a view to causing absorption of the inflammatory products, iodide of potash. Sometimes, however, general tonics, such as the Syrup of the Hypophosphates are better than these.

When the catarrhal inflammation is only incipient and due to an endometritis, curetting of the uterus will effect great benefit but the operation must be

performed with the greatest care. If the inflammation is advanced or if there be any pelvic peritonitis, the operation may be attended with the most disastrous results. Acute inflammatory action is set up and haemorrhages either into the tube, the cellular tissue or the peritoneal cavity are produced. If there is pus in the tube, curetting may force some of it through the ostium abdominale or, if it is encysted, may cause rupture of the pyosalpinx. The difficulty, therefore, is in the diagnosis, as one can never be certain that the inflammation is not purulent. All acute symptoms should be reduced by antiphlogistic measures before the operation is even thought of.

In recent years massage has been recommended for the treatment of inflammation of the appendages. Seiffart (35) in 1888 recommended it strongly and there has been much written on the subject. It is not an elegant method and is open to many objections. It should be practised only when the inflammation is chronic and when one is certain that there is no supuration or cystic accumulation in the pelvis, as this

may be ruptured.

The application of electricity to the uterine cavity has been strongly advocated by Apostoli with a view to curing a salpingitis. There is no doubt that it has a beneficial effect in various affections of the uterus but whether it is similarly useful in diseases of the appendages is extremely doubtful. It is open to the same objections as curetting and massage when the inflammation is acute or suppurative.

In chronic cases, when the patient can afford it, visits to the numerous health resorts at home and abroad where she can try the effects of the various springs and baths are often no doubt beneficial.

If these methods fail after a fair trial of some months duration, then the vexed question of oöphoro-salpingotomy arises. When we are led to suppose that the salpingitis is purulent and may at any time endanger life, or when, though non-purulent, the inflammation has become chronic and has incapacitated the sufferer for her work, or is deteriorating the general health

health, then the operation is justifiable. It is difficult to estimate the amount of pain which an individual suffers. If, however, in the case of the poorer classes the tubal dysmenorrhoea or the intermenstrual pain is so severe as to cause the patient to take to bed and leave her work, or if, in the case of the rich, the pain interferes seriously with ~~their~~ her pleasures, we may conclude that the suffering is genuine and, if all other means fail to relieve, salpingo-ovariotomy must be considered.

When the salpingitis is a local manifestation of tubercle, the tubes should be at once removed but only where there is no evidence of tubercular disease in other organs. Such cases, however, are seldom seen.

To Lawson Tait will always belong the credit of having introduced and practised most energetically the operative treatment of inflammatory diseases of the uterine annexa. He directed attention to these diseases as a cause of chronic invalidism and showed that by operation the sufferer could be restored to health and in many cases life could be saved.

Galabin (36) examined the record of 302 autopsies on females. Tubal disease existed in 26 or 8.6. per cent and it was the primary cause of death in 7. or 26.8. of those with tubal disease, 2.3. per cent of the total deaths. Hence the importance which Tait attaches to inflammation and especially suppuration of the Fallopian tubes is not exaggerated.

The operation is, as a rule, a safe one and consists in opening the abdomen, separating the perisalpingitic and peri-ovarian adhesions, and removing the appendages as near the uterus as possible.

RECENT STATISTICS.

Schaute (37) reports 216 operations for removal of the uterine appendages for inflammatory disease with 13 deaths or 6 per cent. In 144 of his 216 cases there was either no pus or the pus was septic. Of these four died - 2.8 per cent. The after history was ascertained in only 97 cases. Of these, 81 were cured, 12 improved and in 4 there was no relief.

In 33 cases gonococci were discovered. 16 of these, the tube being removed without escape of its contents, did well. Of the other 17, 2 died. The

after history was known in only 18 cases. Of these 17 were cured and 1 improved. In 12 cases the pus contained strepto- and staphylo-cocci. One of these was removed intact; in the other 11 the pus escaped into the peritoneal cavity. Six of these were drained with 5 cures and 1 death. The abdomen was closed without drainage in the other 5 with 3 recoveries and 2 deaths. In one of the three which recovered pelvic abscess formed. Schaute, therefore, holds that if the pus contain bacteria the tube should be entirely removed rather than resected.

Martin (39) has abandoned drainage. If he suspects the pus may be infective he removes the tube entirely; if not, the tube should be opened, washed out, and resected, after scraping the mucous membrane if necessary. He has performed this operation in 40 cases with 2 deaths.

Chrobak (38) reports 147 operations for inflammatory disease of the uterine annexa with 5 deaths, 3.4 per cent.

Sweifel (40) 140 operations with 4 deaths. In 123 there was no suppuration and all recovered. In 82

pus was found and 4 of these died.

Terrier and Hartmann (41) relate 59 cases with 7 deaths or 12 per cent. The after history, which they were able to determine in only 46 cases, is interesting although not very satisfactory. Forty two have not suffered since the operation. The only inconvenience which some of the patients suffered was the persistence of a faecal fistula. This happened in 8 cases and Terrier and Hartmann hope to cure them if allowed. In 6 others there were faecal fistulae which remained open from a few days to several months. In one case the fistula remained open for eleven months and in another for thirteen before the patients were cured.

Delageniere (42) reports 22 cases with 1 death, 4 per cent.

In 1889 Lawson Tait (50) reported 263 removals of inflamed appendages with 9 deaths.

These figures show that oöphoro-salpingotomy for inflammatory disease may be performed with a small mortality (about 5.5 per cent) and that when suppuration exists there is more risk in the expectant treatment than in the operative.

It has been recommended, especially by Galliard ~~and~~ Thomas, by Byford and by Picque, that the tubes and ovaries in certain cases should be removed per vaginam but the difficulties of the operation are so numerous that it has been adopted by only a very few in this country.

Pean (44) proposed to remove per vaginam the uterus as being the source of infection in cases of inflammatory diseases of the appendages. The operation has, however, been strongly condemned, especially by Doleris, on account of its dangers.

It has been found that occasionally it has been sufficient to simply separate what abdominal and pelvic adhesions exist in order to relieve the pain and other symptoms complained of. Hadra (45) was the first to advocate this procedure and later Polk (46) modified the operation by removing only one tube and in the case of the other simply separating adhesions and expressing the muco pus from its lumen.

Mundé (47) besides expressing the pus proposed that a catheter be introduced into the ostium abdominale and the tube washed out with a warm corrosive sublimate solution 1 in 5000.

Martin (48) in some cases, dealt not only with the adhesions but endeavoured to restore the function of the ampulla by opening up its obliterated extremity.

There is certainly a tendency on the part of some authorities to treat simply the adhesions by abdominal section and in this way many ovaries and tubes are saved but in the vast majority of cases the more radical operation of oöphoro-salpingotomy is more safely performed.

It frequently happens that for months after the operation the patient seems to have derived no benefit. She complains of pelvic pain much the same as before, this being due to a local peritonitis surrounding the seat of the operation and to a continuance of the inflammation in the stump of the tube. Very commonly this subsides after a time but when it has not yielded to the ordinary treatment of salpingitis by hot douching and blistering it may be necessary to once again open the abdomen and separate the adhesions which have formed round the pedicle.

On the other hand, it must be confessed that in many cases the operation absolutely fails in its object, the patient being in no way relieved.

Pozzi (49) holds that a month after every operation on the Fallopian tubes the uterus should be curetted and an antiseptic applied to the endometrium; the object of this procedure is to remove the source of infection of the portion of the tube that is left. The treatment seems natural but is very seldom carried out in this country unless special attention is directed to symptoms arising from a severe endometritis.

Menstruation does not always cease immediately after removal of the tubes; it may do so, however, or be lessened in amount. This, according to Tait depends on whether much or little of the tubes is left, these organs, in his opinion, being the primary cause of menstruation.

Lusk (51) states that in 86 per cent menstruation ceases after removal of the appendages.

PELVIC HYPERAEMIA.

Short of inflammation with its various stages of congestion, exudation, and resolution or suppuration the Fallopian tubes share in the condition described, especially by Tait (52) as pelvic hyperaemia.. This normally occurs at every menstrual period but in some is very much exaggerated so that it gives rise to distressing symptoms - especially menorrhagia - resembling those of acute inflammation of the uterine appendages. It is not uncommon in young girls soon after puberty, especially in those who are brought up in refinement and overtaxed at school. It is often associated with an infantile undeveloped uterus and Tait suggests that in such cases the arrested development of the uterus leads to imperfect menstruation and in consequence the uterine appendages undergo a passive congestion from an increased supply of blood. This excessive hyperaemia of the pelvic organs is also frequently found after marriage but in these cases, unless the cause be removed, the line between mere passive congestion and active inflammatory changes is readily

overstepped.

In girls, the treatment consists in absolute rest at the menstrual periods, the administration of the salts of potash, especially the chlorate, and the avoidance of overwork generally. I have seen one especially well-marked case of this kind.

Case IX. A. W. aet. 18, well developed but somewhat anaemic, had complained for a year, at each period of great pelvic distress, somewhat profuse menorrhagia lasting for a week, and some slight leucorrhoea for a few days after the flow had ceased. In the intervals she enjoyed fairly good health. The patient indulged in but little out-door exercise and had for two years been working hard for examinations with but little rest. No local examination was made but she was ordered rest, Iron, Caulophyllin and Pulsatilla. She gradually improved and after four months was well.

PERISALPINGITIS.

This is merely a sub-division of pelvic peritonitis, in itself a wide subject, so that it does not fall to be discussed here in great detail. It is an inflammation of the peritonic covering of the Fallopian tube and is almost invariably associated with a similar affection of the external coat of the uterus.

Perisalpingitis is the result of either the direct extension of an inflammatory process through the different coats from the mucous membrane of the tube or of the irritating effect of the escape of inflammatory fluid through the ostium abdominale into the peritoneal cavity. It has also been pointed out, especially by Championnière, (11) that direct infection of the peritoneum from the uterus is possible by means of the important lymphatic connections which exist.

This local inflammation may be discovered in various stages. It may amount to a mere infiltration and oedema of the peritoneum and of the subperitoneal connective tissue, or adhesions may be found between adjacent parts, or serous fluid may be exuded, or this

may have been transformed into pus giving rise to an important type of pelvic abscess.

Even when the process consists in only an infiltration and oedema of the pelvic peritoneum in the region of the tube a distinct swelling or at least resistance may be made out bimanually and it is not easily differentiated from a tumor of the tube itself. This pathological condition is frequently of an intermittent character - appearing and disappearing in the course of a few days, just as the symptoms of its presence do. If the inflammation persists, adventitious membranes are speedily formed so that the ovary and tube are bound together and these, having by this time usually prolapsed into the Pouch of Douglas, become attached to the posterior wall of the uterus. (Plates 20 & 24) These false membranes frequently enclose spaces in which collections of serous fluid may be found, these giving rise to all the symptoms and signs of, and often having been mistaken for, ovarian tumours.

Perisalpingitis may become purulent. The result is a peritonic abscess commencing, as a rule, in the Pouch of Douglas, adhering on every side to the soft

and hard parts of the pelvis and being attached to and cut off from the omentum or the intestine by an adventitious membrane. It is frequently very difficult, even on opening the abdomen, to distinguish this form of pelvic abscess from a large pyosalpinx which has, as it grew, become adherent to surrounding parts in every direction. The diagnosis is important as complete removal of the abscess sac should be aimed at in the latter while it cannot be hoped for in the former. No doubt, even on post-mortem examination, it is frequently impossible to determine whether the abscess wall be peritoneum, false membrane or dilated tube. As well as from pyosalpinx, which may sometimes be recognised by its being pediculated, a pelvic abscess from perisalpingitis has to be differentiated from suppuration in the broad ligament, a suppurating haematocoele, and an extra-uterine pregnancy which has terminated in abscess formation.

SYMPTOMS.

In the course of a salpingitis, very commonly the patient complains of acute exacerbations of her symptoms. These are due to intermittent attacks of serous perisalpingitis. She has increased malaise and pelvic distress but seldom any rise of temperature while on examination one finds increased tenderness in the fornices and more marked fixation of the uterus. There is a general puffiness and fulness about the pelvic organs which, however, may disappear in the course of a few days leaving here and there hard nodules which can be felt in the various culs-de-sac and resemble enlarged tender lymphatic glands.

When perisalpingitis is purulent and a peritonic abscess is formed, probably due to the escape of pus from the Fallopian tube, all the symptoms of acute peritonitis are observed - sharp pain, a thready pulse, anxious facial expression, vomiting, fever, rigors and abdominal distension, besides symptoms arising from the disorder of neighbouring organs, constipation and dysuria.

Associated with pelvic suppuration diaphragmatic pleurisy is not uncommonly found. This Potain, (53) believes to be purely reflex but A. Lasne, (54) has endeavoured to demonstrate that it is due to direct infection through the lymphatic channels.

Per vaginam, the uterus is frequently, especially in the earlier stage of suppuration, fixed and its position will depend on the situation of the pus. When the purulent effusion fills up the Pouch of Douglas, as it usually does, the uterus is pushed forwards and upwards so that the cervix may ^{*}lie above the symphysis pubis. The abscess itself is a smooth rounded tumour but it is difficult to determine its upper limits. Arterial pulsation may be felt but fluctuation can only occasionally be made out.

The abscess may remain quiescent for a lengthened period with remission of the symptoms but, sooner or later, an attempt at rupture is made with renewal of pain and increase of fever. The rupture, which may occur into, for example, the rectum, the vagina, or the prevesical cellular tissue is usually followed by

temporary relief but, as a rule, a fistula continues. Chronic ill health and exhaustion from prolonged supuration and septic absorption result. The abscess may close for a time, only, however, to rupture again with a recrudescence of all the symptoms.

A pelvic abscess may be tubercular just as the inflammation of tube which causes it may be so.

Prognosis.

In the case of serous perisalpingitis the prognosis depends on the lesion and condition of the tube which cause it. A pelvic peritonitic abscess may result in death from acute general peritonitis, from rapid septicemia or from gradual exhaustion. Even though it be cured by operation, the patient is still liable to the dangers of a recurrence unless the primary cause in the tube be also removed. Cases are recorded in which, besides producing disastrous results on the pelvic organs, the inflammation has extended along the ureters setting up a fatal pyelonephritis.

TREATMENT.

That of a simple serous perisalpingitis is the same as of inflammation of the tube itself - rest, hot water injections, and other antiphlogistic measures. Recurring attacks are frequently the indication which lead surgeons to perform the operation of salpingo-oöphorectomy. Serous effusions should not be tapped as this tends to lead to suppuration and further, they often disappear under less energetic treatment. Professor Laroyenne (55), however, recommends it but there must be the objection that the cause is not removed.

When pus has formed the abscess cavity should at once be opened but the great difficulty is to decide where. Each case must be judged upon its own merits. Numerous operators have recommended many different methods of treatment under similar conditions. Thus, when a perisalpingitic abscess points towards the vagina, some simply open it by means of a trocar and canula, others open and drain or stuff the cavity with iodoform gauze; others open and curette the sac wall

while others perform laparotomy.

If pointing towards the rectum, Byford (56) advocates ensuring the escape of pus by this channel while others believe that drainage should be effected by perineotomy or through the parasacral region.

When the pus appears most superficial next the abdominal wall laparotomy should be performed but if it is found that the abscess cavity is sufficiently low down in the Pouch of Douglas, drainage may be effected per vaginam.

If pointing in no special direction various methods of reaching the pus have been recommended. Sanger (58) and Hegar (57) have practised perineotomy; Zuckerkindl and Wiedon have opened the cavity through an incision on the parasacral region.

But the most satisfactory method of all, and this applies to nearly all peritonitic abscesses, is by laparotomy, as especially recommended by Lawson Tait (59). The great advantage of this operation is that the incision is so situated that it is possible to explore the whole pelvic organs and if the case turn out to be one of suppuration inside, not outside, the tube the abscess may be removed entire.

Thus, Davis (60) records a case in which he performed abdominal section for a pelvic abscess and was able to cure not only the peritonitic abscess but to remove the cause - a double pyosalpinx.

An incision is made through the abdominal parietes and the fingers introduced to ascertain the relations of the abscess cavity which is then aspirated and the walls drawn up and stitched to the edges of the superficial wound. The sac having been opened, it is stuffed with iodoform gauze or else freely drained. If, as often happens, it be impossible to draw up the sac, the cavity is thoroughly cleansed and if it be favourably situated drainage is effected per vaginam by an opening made into the posterior cul-de-sac. The first opening into the abscess is then carefully stitched, the peritoneal cavity irrigated and the abdominal wound closed. In some cases when the adventitious walls of the perisalpingitic abscess are not sufficiently well defined for this procedure the cavity must be simply cleansed and stuffed with an antiseptic dressing.

XXXXXXXXXXXXXXXXXXXX

PART II

PYOSALPINX.

XXXXXXXXXXXXXXXXXXXX

PYOSALPINX.

During the past year I had an opportunity of watching a ^acase of pyosalpinx from nearly the beginning to the end. It presents most markedly all the features of the disease.

Case X. Mrs. B., aet. 21., was admitted to Ward 28. on January 19th 1893. She complained of constant pain in the left side, much aggravated at the menstrual periods, of dyspareunia, of some menorrhagia and of general deterioration of health. She was married in July 1892 to a sailor and before that time had enjoyed the best of health. Soon after marriage the patient complained of painful and frequent micturition, and also of a somewhat profuse vaginal discharge which she said was yellow in colour and 'like matter'. The patient had, therefore, evidently an attack of acute gonorrhoea.

On admission she was rather emaciated but otherwise her general condition was fair. Abdominal examination revealed nothing, but, per vaginam, to the right and

behind the uterus, which was somewhat enlarged, a rounded cystic-like swelling could be felt. Bimanually, this was made out to be somewhat pear-shaped as it seemed to taper towards the uterus and to be turned back at an acute angle to that organ. Fluctuation could not be determined. The examination caused the patient a considerable amount of pain. On the left side there was also tenderness on pressure in the fornix but no definite tumor could be made out. From the history of the case, from the symptoms and from the condition found in the pelvis a diagnosis of pyosalpinx was made. The patient was, therefore, advised to undergo the operation of abdominal section with a view to removing the diseased tubes and ovaries but this she refused to do and accordingly she left the ward not improved.

No more was heard of her till July 7th. when she again sought admission and begged for an operation to relieve her sufferings. It appeared that almost ever since her return home she had been confined to bed on account of rheumatism which had proved most intractable. It did not attack or continue in one joint

Name Mrs Bennett

Age 21

Disease

Pyoral part

Result

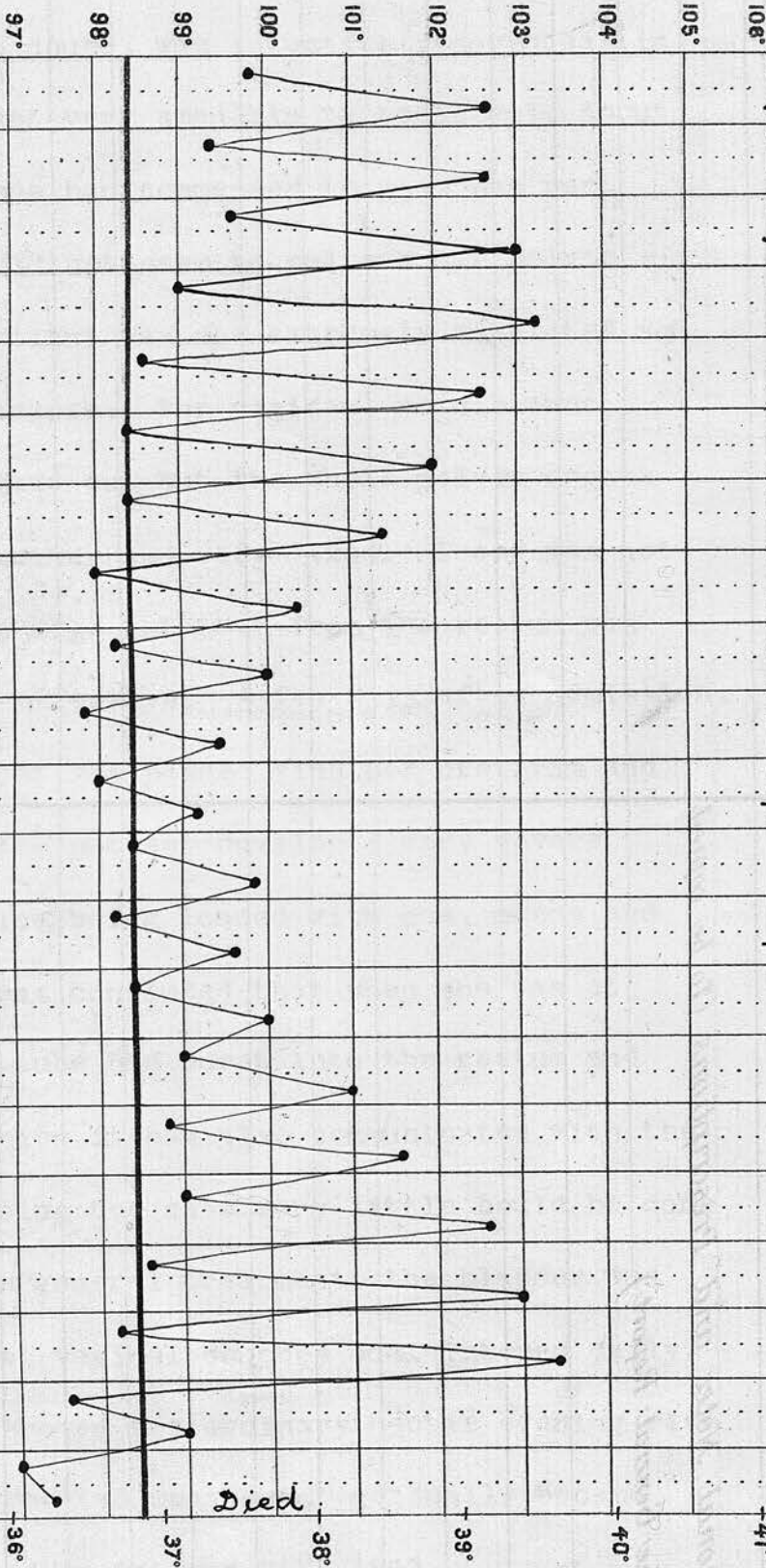
death

Sept-

17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7
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1093

TEMPERATURE FAHRENHEIT'S SCALE.



TEMPERATURE CENTIGRADE SCALE.

specially but, no doubt, was infective (gonorrhoeal) in nature and hence not very amenable to treatment. About June 10th. too, she had commenced to pass pus per rectum but this did not seem to relieve her pelvic distress. The patient was now extremely emaciated and cachectic in appearance. Per vaginam, no distinct tumour could be made out but the whole pelvic organs seemed matted together and very fixed. There was not much vaginal discharge but that from the rectum was profuse and very offensive. A few days after admission, it was noticed that she passed wind per urethram and soon thereafter the patient developed very severe cystitis, the urine being loaded with pus, mucus and phosphates. It was concluded that when she was at home the dilated tube had burst into the rectum and that after admission it had also communicated with the bladder. Such being the case very little could be done for her. Besides general treatment, the bladder was washed out and hot vaginal douches administered daily. The temperature showed the ordinary hectic evening rise. She lingered on for two months but gradually became exhausted and died on October 7th. 1893.

Permission was obtained for a post-mortem examination of the pelvis. The organs were removed en masse; a drawing of them is shown on Plate 29.

In the centre is the fundus uteri and on each side turning sharply back into the Pouch of Douglas is a tube much dilated and containing pus. The left is entire but the right one has ruptured near the proximal end of the tube. Here there is an irregular space with a raw ulcerating surface covered with pus and this communicates with the bladder through a small opening (Bristle A) and by a larger one with an abscess cavity situated in the right broad ligament; (Bristle A.) On pressure, creamy pus exuded freely from the ragged opening into the tube. There is also a direct communication between the bladder and the abscess cavity (Bristle B.) as also between this and the rectum (Bristle C). The bladder wall shows a condition of acute cystitis. There was, of course, also advanced pelvic peritonitis with matting of the organs.

Such is the course of many cases of pyosalpinx, if left to themselves, but the advances of abdominal

surgery have greatly reduced the number of such unfavourable results. The chances are that had the woman submitted to an operation in January she would have been saved, but by the time of her second admission the fatal rupture had occurred.

It is interesting to note whether the abscess cavity in the broad ligament was such, pure and simple, or whether it was really a broad ligament cyst which had become infected from the pyosalpinx and suppurated as the result. Such cysts frequently are associated with tubal dilatation but in this case the swelling felt in the left side had all the characters of a dilated tube and did not come close up to the uterus as sessile cysts generally do. The probability is, then, that the tube ruptured into the broad ligament, the layers of which became separated and this abscess later burst into the rectum. Later still, communications were formed between the tube and the bladder and between the broad ligament abscess and the bladder. The walls of the abscess cavity were thick and corrugated being thrown into folds and rough on the surface. // The wall of the Pouch of Douglas was invaginated into the space.

AETIOLOGY of TUBAL DISTENSION.

In connection with the causation of tubal dilatation Freund (61) laid stress on the fact that one of two forms of Fallopian tubes are found. There is one which is the normal - almost straight and of the usual calibre, while the other is an imperfectly developed oviduct, being much twisted with here and there necessarily diminished calibre. The latter is the result of a continuance of the infantile condition and in these cases Freund holds that cystic dilatations are apt to occur owing to the convolutions of the tube and the obstructions of the lumen.

Dr. Haultain, (62) in a paper in the Ed. Med. Journal of Dec. 1890, discusses contortion of the tube as a distinct pathological lesion. He considers it the most common morbid condition of the tube, and attributes to it many distressing symptoms. The inflammatory processes which usually accompany it Haultain considers secondary and outside the tube as shown by the fact that the structure of the tube is unaltered, the special angular bending being the only change.

Frequently, at the angles of the twist, the surfaces become adherent and ultimately at these points the lumen becomes obliterated. Surrounding the contorted tube, there may be a considerable amount of perisalpingitis with deposit and adhesions but this does not always accompany the primary condition. Dr. Haultain does not deny that, on the other hand, in many cases the convolutions may be the result of the dragging of inflammatory adhesions. He considers, however, that to the condition of twisted tube alone may frequently be attributed the now well known symptoms of disease of the appendages, sterility due to the occlusion of the tube, constant pain in the side and the premenstrual dysmenorrhoea due to the congestion which necessarily accompanies the bending of the tube. As regards the aetiology Haultain recognises two causes - the first is the continuance of the infantile condition as described by Freund, and the second is a regeneration to the foetal state. (Plates 27 & 28.)

This second form is found in women who have borne children and is due to an incomplete involution of the

tube after labour. It has been shown that during pregnancy the Fallopian tubes, like the uterus, hypertrophy. They are at full term from 6 to 8 inches long and that this is not due to mere elongation is shown from the fact that the calibre is not diminished and, as H. Thompson of Dorpat has shown, the individual muscular fibres are enlarged to twice their normal bulk. Dr. Haultain therefore theorises that, if the involution of the tube be imperfect, twisting will be the result as the loose attachment of the organ to the broad ligament does not prevent it.

" If in a tube thus contorted we have set up a secondary endo-salpingitis the result will doubtless be retention of the secretion from occlusion of the tube at the angle of bending, and we will thus have formed a haemato- hydro- or pyosalpinx, according to the nature of the secretion."

It is only on the theory that simple angulation causes obstruction that many cases of dilatation of the tube, while the uterine end is permeable and not dilated, can be explained. The cause may not always be

recognised as the exploring bristle or probe straightens the tube.

AETIOLOGY of PYOSALPINX.

Pyosalpinx is a further stage of purulent salpingitis and is the result of progressing pus formation along with an obstruction, partial or complete, to its outflow into the uterus. This obstruction, as has been discussed above, may be from tortuosity of the tube but it has also been shown that if the inflammation be very intense, besides the protective closure of the ostium abdominale, the uterine end may cease to be permeable on account of the swelling and infiltration of the walls of the tube. The obstruction may not be complete ^{but} still sufficient to predispose to dilatation of the tube if the severe inflammation persists.

As a rule, only the outer two thirds of the tube are dilated but occasionally the whole length is

distended. The fimbriated extremity which is adherent to the ovary is usually involved but in a few cases it is found projecting free beyond the accumulation of pus. When the ampulla is adherent to the ovary this organ becomes more or less fixed with the dilated tube, the whole being surrounded by adventitious membranes. Very frequently the ovary is also transformed into an abscess cavity which may or may not communicate with the dilated tube, so that many cases of pyosalpinx are really salpingo-ovarian abscesses.

Generally the portion of the tube next the uterus is not dilated but the walls are much thickened.

The conditions which lead to the formation of a pyosalpinx are those which set up purulent salpingitis, plus an obstruction to the outflow, the causes of which have been discussed at length above.

The exciting cause of the suppuration is gonorrhoeal or non-gonorrhoeal infection occurring post partum but especially post abortum. Some cases, too, have been traced to surgical interference with the uterus while others are supposed to owe their origin to the zymotic fevers.

Tait, however, says he has never known pyosalpinx have an exanthematic history.

Quite recently M. Mabit (63) has recorded a case of pyosalpinx which followed and was the result of typhoid fever. The case is especially interesting as it was cured by dilatation of the uterine canal and the orifice of the tube.

Pyosalpinx has been found associated with fibroid and malignant tumours of the uterus. In the former case it is probably a coincidence in the latter it is the result of a direct septic infection and its rupture often the immediate cause of death in cancer of the uterus.

Dr. J. K. Fowler (64) in a 'Contribution to the Pathology of Hydro- and Pyosalpinx' records 15 cases and in two of them pyosalpinx was associated with uterine cancer. The records of the Middlesex Hospital indicate that pyo- and hydrosalpinx complicate uterine cancer in the proportion of not less than 10 o/o.

Not infrequently a hydro or haematosalpinx suppurates and become transformed into a pyosalpinx.

SITE of PYOSALPINX.

The dilated tube may be situated in the normal plane to the left of the uterus or, as is seen in Plate 29. It may be turned back at an acute angle to the uterus. Perhaps most usually, however the diseased appendages prolapse into the Pouch of Douglas and the swelling is therefore, felt behind the uterus.

Case XI. I saw in private with Dr. Croom a case that had been treated for years as a simple retroversion by means of pessaries which caused great pain and discomfort. Examination under chloroform, especially per rectum, revealed the true nature of the case. It was one of pyosalpinx which had got fixed below a retroverted uterus and which had been mistaken for the displaced fundus uteri. (Plate 31.)

SIZE of PYOSALPINX.

A case is recorded by Dagron (65) in which a pyosalpinx was as large as a stomach and contained 37. 5 ounces, and Elliot (66) records another which he described as being as large as a cocoanut. It is, however, possible that such cases are really ruptured pyosalpinxes, the pus being circumscribed by adventitious membranes. As a rule, the swelling is only about the size and shape of a small pear, and yellowish white in colour.

The ^{*}wall of the tumour varies very much in thickness; at first it tends to hypertrophy and to be thicker than normal but if the condition has persisted for some time the walls of the tube become thin and there are frequently spots where the wall is a mere membrane. The inner surface is then smooth and velvety and the cavity contains creamy pus which, if the sac is near the rectum, may have a foetid odour.

The microscope shows that the internal surface is lined with layers of columnar epithelium and covered with vegetations which are much thicker than those of

catarrhal salpingitis owing to the greater infiltration of embryonic cells. In the deeper layers of the mucous membrane spindle shaped cells are abundant and nearer the surface the tissue is a mass of rounded cells resembling granulation tissue. The undilated portion or portions of the tube are also infiltrated with inflammatory cells. In some cases, especially in an early stage, there is an hypertrophy of the muscular coat and it has been said that the contractions of the muscular fibres would account for the occasional evacuation of pus into the uterus but it is much more likely that this is due to an overflow.

As far as my personal observation goes, there are, therefore, three distinct forms of 'pus tube';-

(1) cases in which the lumen of the tube is not much dilated and the walls are thickened (purulent salpingitis.) (2) cases in which the lumen is dilated to some extent but the walls are still hypertrophied (an intermediate form) (3) cases in which the normal configuration of the tube is lost, the lumen being enormously dilated and the walls atrophied and membranous.(true pyosalpinx.)

A tubercular abscess of the tube can only be recognised by the microscope. Caseous masses found in the tube have been supposed to be characteristic of tuberculosis but these might be merely inspissated pus and can be pronounced tubercular only when the typical follicle is found with giant cells surrounded by nucleated cells. As a rule, 'cold abscess of the tube' is associated with tubercle of neighbouring organs especially of the peritoneum and this, of course, materially aids the diagnosis.

Koch's bacillus has occasionally been found in the pus but even in undoubtedly tubercular cases this is not always found just as Neisser's gonococcus is not always found in gonorrhoea.

SYMPTOMS and SIGNS.

It is remarkable that it should be possible for a woman to go about and enjoy apparently good health carrying in one or other or both tubes several ounces of pus, but such is the case. Frequently, this serious lesion does not affect the general health or only to a slight degree. Lawson Tait (67) records a case in which he removed a double pyosalpinx on the point of rupture and yet the patient had been absolutely unconscious of any suffering. The septic fluid becomes so completely encysted by the occlusion of both ends of the tube and is so often further ^{retained} ~~protracted~~ by surrounding inflammatory adhesions that absorption of ptomaines does not occur so that it is the exception to find any rise of temperature or general disturbance of the system.

In the vast majority of cases, however, the patient complains of definite although not characteristic local symptoms. They are those of ordinary non-cystic salpingitis - pain in the side, premenstrual dysmenorrhoea, menorrhagia, dyspareunia and leucorrhoea.

In some cases amenorrhoea exists when the destruction of the appendages is so great as to absolutely destroy their function while in others there is no disturbance of menstruation whatever.

As a symptom of cystic dilatation of the tube much importance has been attached to one which is called the 'hydros tubae ^{profluentis} ~~intermittens~~' of Froriep. It consists in the discharge at irregular intervals of serum, pus or blood, according to the nature of the tubal affection, which is preceded by an attack of colicky pain in one or other side. Whether this symptom is due to contraction of the sac forcing the fluid through a uterine orifice, only partially closed, or to a discharge of the uterine contents, the result of reflex contraction of a necessarily congested uterus, is extremely doubtful. At all events, in nearly all cases the uterine extremity of the dilated tube is closed so that the spontaneous discharge of its contents must be exceedingly rare although cases are recorded where the contents were expelled by pressure from above.

Frankenhauser (68) observed this occurrence in a girl

suffering from haematosalpinx and Routier (69) a case in which a pyosalpinx was similarly emptied.

Direct physical examination by the bimanual method is the only reliable means of determining the presence of a pyosalpinx and even then the diagnosis is often extremely uncertain and problematic. The examination must be undertaken with the greatest care as the sac may be easily ruptured with fatal results.

The cystic swelling may be free or fixed. In the former case one grasps between the two hands a pear shaped tumour which seems attached to the uterus by a distinct pedicle - the undilated portion of the tube. Fluctuation occasionally but rarely can be determined and the examination always causes pain. The tumour may, however, become fixed on one or other side, but more commonly in the Pouch of Douglas, by surrounding inflammatory adhesions and in such a case the diagnosis becomes more difficult. One can determine that the appendages are hypertrophied, displaced and fixed but the exact nature of the lesion can be only a matter of conjecture.

DIFFERENTIAL DIAGNOSIS.

To diagnose a tubal dilatation at all is difficult but to differentiate between the three chief forms of such dilation is still more difficult. Tait (70) indeed, holds that the differential diagnosis is impossible. It is said that haematosalpinx is generally unilateral whereas pyo- and hydrosalpinx are usually bilateral. The significance of this statement will be seen when the nature and aetiology of haematosalpinx are discussed. The history of gonorrhoeal and puerperal infection is of course, most important in determining that the case is one of pyosalpinx. If fistulae are found, for certain a pelvic abscess exists but whether this has its origin in the Fallopian tube it is impossible to say. As has been pointed out before, the temperature, as an aid to diagnosing purulent accumulation in the tube, cannot be relied upon. The examination of a pyosalpinx gives rise to greater pain than that of a hydro or haematosalpinx. But pain is a symptom and it is difficult to estimate the amount which an individual suffers.

The tumour may be mistaken for a small ovarian cyst or for a broad ligament cyst. The latter, however, comes more closely up to the uterus and generally displaces that organ. A pediculated fibroid frequently simulates a pyosalpinx but the uterus is enlarged in the former condition although the hypertrophy in a sub-peritoneal fibroid may not be marked. There is no apology, however, for such a mistake as a rectal examination will determine the nature and situation of the attachment to the uterus.

Tubal pregnancy has also to be differentiated and the distinction is not easy. The signs of pregnancy, enlargement of the uterus and the expulsion of the characteristic membrane are diagnostic symptoms. A tubal gestation is always fixed, other forms of tubal distension may be free.

Tenier, Championnière (71) and Pozzi (72) report interesting cases in which enlargement of the pelvic glands and lymphatics produced all the physical signs of a pyosalpinx.

Dolérís (73) mentions two cases in which part of the intestines had become matted together and fixed in

the Pouch of Douglas and this condition was diagnosed as an inflammatory dilatation of the Fallopian tube.

For the purpose of differential diagnosis an exploratory puncture is practically never a safe procedure, nor justifiable. The intestines may be wounded or septic pus may either escape into the peritoneal cavity or if limited may at least increase the abscess formation.

There are two most important aids to the diagnosis of diseases of the appendages which should never be forgotten. The first is chloroform. The impression and this is, of course, the true one which one gets from an examination when the patient is anaesthetised is often totally different from that received before and is much more reliable. The second aid is a rectal examination by which the relation of parts can be much more accurately determined and the whole course of the Fallopian tubes much more readily palpated.

Case XII. in which the symptoms and signs of
a small ovarian cyst simulated in many
respects a pyosalpinx.

Mrs. L. aet. 32. was admitted to Ward 28. on
August 15th. 1893 complaining of a tender swelling in
the left iliac region. For four months she had been
under treatment for rheumatism in Ward 24. She had
four children, the last one seven months before admis-
sion to Ward 28. and her present pelvic symptoms had
supervened four months after delivery.

On examination, lying to the left and in front of
the uterus and extending upwards so as to be felt
above the pelvic brim, was a very tender, fixed, some-
what pear-shaped cystic swelling about the size of a
small orange. The uterus was enlarged and there was
an abundant leucorrhoea from marked endometritis.

At the menstrual periods she complained of severe pre-
menstrual dysmenorrhoea and menorrhagia while the con-
stant pain in the side became much aggravated. The
patient had occasional evening rises of temperature

and when such was the case her pelvic distress was so severe as to necessitate the administration of opium and the application of hot fomentations. From the symptoms and signs a provisional diagnosis of pyosalpinx was made and for some time the case was carefully watched. As she did not improve, and the diagnosis became more certain, on Dec. 12th. the abdomen was opened with a view to removing the diseased appendages. The tumour, however, proved to be an ovarian cyst and was so impacted in the pelvis that all the patient's symptoms were readily accounted for. The oviduct but for some adhesions to the surrounding parts was practically normal.

The case illustrates the great difficulty which exists in diagnosing a purulent distension of the Fallopian tube.

COURSE and PROGNOSIS.

There is little or no tendency to spontaneous cure on the part of a pyosalpinx. For a long time the condition may remain quiescent and give rise to little or no trouble. But sooner or later the patient begins to suffer and becomes a chronic invalid. She is especially liable to intermittent attacks of pelvic peritonitis (perisalpingitis). Tait attributes these acute exacerbations to the escape of a few drops of pus into the peritoneal cavity. Fever and increase of pain with the results of these are the chief symptoms of which the patient complains.

At any moment, too, the tube may rupture into the peritoneal cavity with the ~~most~~ ^{fatal} ~~disastrous~~ result, and, no doubt, many cases of sudden death in women, apparently in good health, are to be attributed to this cause.

Dr. Taylor (74) in a paper in the Lancet in 1889 recorded two cases in which he found the cause of sudden death to be the rupture of a pyosalpinx and drew attention to the subject from a medico-legal point of view.

A tube distended with pus generally prolapses into the Pouch of Douglas and, as it continues to increase in size, it frequently becomes adherent to the rectum and subsequently opens into it. Occasionally the rupture takes place into the vagina and more rarely into the bladder. There may be a communication with both the rectum and the bladder as in Case X.

Veit (75) pointed out that the rupture of a purulent tubal dilatation into the vagina was not, in the majority of cases, followed by recovery as is more readily the case when the suppuration is in the cellular tissue of the pelvis. A discharge of offensive pus continues which leads to great loss of strength from protracted pus formation.

Herman (76) throws doubt on the accuracy of Veit's diagnosis and prognosis in his four cases. He questions whether the abscess was really in the tube and suggests that the pus may have escaped from a suppurating cyst.

Associated with a pyosalpinx a cyst of the broad ligament is sometimes found into which the pus finds

its way leading to suppuration of the cyst and the formation of a large intraligamentous abscess. Very frequently a supposed pyosalpinx is found to be really a tubo-ovarian abscess.

The distinction is not always easy and careful examination is required to determine the true nature of the case. Cullingworth (77) in 1892 showed at the Obstetrical Society of London a large pyosalpinx which had at first all the appearances of a tubo-ovarian abscess.

An ovarian abscess occurring independently of inflammation of the tube Bland Sutton (78) believes to be generally tubercular.

Again, the suppurating tube may point in the iliac fossa or give rise to an abscess in the cavity of Retzius in the prevesical cellular tissue.

The formation of a fistula is generally followed by relief of the symptoms of septic absorption, if such exist, but as a rule this is only temporary. The openings may close again with renewal of the distressing pain and exhausting fever until once more the cyst ruptures and so on time after time. If the fistula is

permanent and the patient does not die of supraemia she gradually becomes exhausted from the discharge of pus and the general deterioration of the system resulting therefrom.

From a spontaneous destruction of the germs the
 *
 suppurative process may occasionally cease, the pus becomes clarified and the tumor is converted into a hydrosalpinx. Further, the vessels on the wall of a pyosalpinx may rupture causing haemorrhage into the
 *
 sac and converting the case into one form of haemato-salpinx.

TREATMENT.

Fortunately, nowadays, there is one and only one method of treating a pyosalpinx, viz. removal of the diseased appendages by abdominal section.

Walton (79) was the first to recommend another method and his operation was also performed by

Dolérís (80) and Gottschalk (81). These authorities claim to have succeeded in emptying the distended tube of its contents by dilating the uterus and the orifice of the tube and afterwards curetting. The experiments which formed the basis of Walton and Dolérís' operations were made on india rubber balls and on cadavers, and seeing that in the great majority of cases the uterine orifice of a tube is completely occluded this method of treatment must be not only hopeless but dangerous from the risk of causing rupture.

Thus, Pichevin (82) mentions a case in which curettage undoubtedly caused rupture of a pyosalpinx and the death of the patient.

Some have advocated the passing of a catheter into the tube and thus emptying it but it is needless to say that it is not only a most difficult procedure but one which is attended with the greatest risk to the patient.

Polk (83) advocates the practice of conservative surgery in diseases of the Fallopian tubes. In many

cases he either simply opens up the ostium or removes the dilated extremity or separates adhesions.

Dr. Walter B. Dorsett (84) of St.Louis, in a paper just published (Nov.1893) strongly condemns the universal treatment of pyosalpinx by abdominal section. He claims that many cases can be more successfully treated by the gradual dilatation of the uterus and of the tube by a method of packing the uterus and in support of his views he gives in detail the record of twelve cases. He has, among other observations on tubal abscesses, noticed that on several occasions he has been able to knead pus by means of his index finger from the tube into the uterus and that in such quantities that it would flow out of the cervix uteri into the vagina. If this be but possible he then advocates the packing of the uterus and the rationale of his treatment is based on the anatomy of the tube and on the fact that if one packs a cone tightly the apex tends to become distended as well. Thus, he considers that if the cavity of the uterus is firmly packed for 24 hours a condition of 'muscle-tire' or exhaustion

is produced and relaxation results so that the orifice of the tube dilates and a communication is formed between the abscess and the uterus. The cervix is dilated and the uterine cavity gently curetted and thereafter firmly packed with narrow strips of iodoform gauze. This is removed after 24 hours and, if pus does not follow, the operation is repeated and even a third time it may be done.

In the cases recorded Dorsett was successful in effecting in this manner a copious discharge of pus through the cervix, a subsidence of the tubal dilatation and a speedy cure of the patient.

The cases in which the operation is indicated are those in which the pyosalpinx is situated at the uterine end of the tube and comes close up to the uterus with which it seems continuous; it is contra-indicated when there is a sulcus between the tumour and the uterus or when the tubal abscess has prolapsed into the Pouch of Douglas. In these cases he approves of laparotomy being performed.

The results which ~~Dr.~~ Dorsett has obtained are

certainly remarkable and very interesting as the majority of authorities agree that any manipulation of a pyosalpinx per vaginam is attended with great risk. The first difficulty encountered is the diagnosis as one can never be certain in which part of the tube the pus is situated. An undilated portion of the tube may exist and yet not be felt, the swelling appearing to be close up to the uterus. In such a case were one to attempt to express the pus as Dr. Dorsett has done, a fatal rupture might possibly ensue. Again, in the great majority of cases the uterine orifice of the tube is not only occluded but obliterated so that dilatation of the uterus would have little or no effect upon it, and, lastly, there must be associated with the operation on the uterus a great danger of rupturing the tubal abscess. This method of treatment has not been adopted to any extent in this country and I have no personal experience of it.

On the same lines Dr. Wackerhagen (86) recommends the following method of treatment in cases where the patient has been under constant and early observation,

and where there has been little time for extensive adhesions. " The vulva, vagina, and surrounding parts are cleansed thoroughly, and irrigated with bichloride solution, 1 in 2000. A rubber or steel applicator, wound with cotton and saturated with pure carbolic acid, is passed into the uterus. A small uterine dilator, which has also been dipped in pure carbolic acid, is then introduced into the cervical canal, and gradual dilatation is commenced, which is continued daily until the uterine catheter can be easily introduced, and irrigation practised after each dilatation. As soon as the catheter can be easily passed, pus begins to flow, and the sac is gradually reduced in size until it disappears. After each application a pledget of absorbent cotton^{wool} saturated with boro-glycerate of alum is placed against the cervix and allowed to remain until the next morning, when it is removed, and the vagina is irrigated with borosalicylic acid. Dr. Wackerhagen reports four cases treated in this way, and with good results. He is not able to explain the reason why the pus begins to flow as soon as thorough cervical dilatation is accomplished, but suggests that possibly the

dilatation of the muscular fibres of the cervix may cause a simultaneous relaxation of the tubal attachment of the uterus." (From the Periscope of Obstetrics and Gynecology. By J.W. Ballantyne, M.D., Edinburgh.)

Nevertheless, whenever a diagnosis of tubal abscess is made most authorities agree that the operation of salpingo-oöphorectomy should be performed. It is as well not to operate during an acute attack unless the symptoms are so severe as to indicate the onset of general peritonitis or impending rupture.

On account of the numerous adhesions which usually exist and the danger of allowing the escape of pus into the peritoneal cavity the operation is more difficult than the removal of undilated tubes. If large, it may be necessary to aspirate the abscess but if small it is better to leave it intact. The adhesions are either gently separated or tied, as required, and the pedicle then transfixed by a needle and secured with strong silk by means of a Staffordshire knot.

In removing the tube there is a risk of pus escaping into the abdomen. This must be prevented by

the careful application of sponges so that they surround the pedicle before the dilated tube is severed.

If the difficulty of loosening a tube in the Pouch of Douglas be great, it has been advised that the tube be divided by two ligatures half an inch from the uterus and the adhesions then separated from within outwards.

In some cases where there is difficulty in drawing up the appendages, Tait passes his fingers along the broad ligament and here and there by a series of scratches to a certain extent loosens the attachment of the broad ligament to the pelvic wall. In this way the ligament which forms the pedicle can be more freely separated and more readily drawn up and secured.

Some
Many operators cauterize the pedicle with the thermo-cautery so that if there be a hernia of diseased mucous membrane into the pedicle it may be destroyed. ~~Very~~ *Many*, however do not consider this procedure necessary.

Haemorrhage is not an uncommon complication on account of the separation of adhesions. This, if no

special ^{vessel} ~~result~~ can be secured, can be generally controlled by irrigation with hot water or in more serious cases by a limited and careful application of turpentine, while in still others packing has to be resorted to. The ill effects of a pelvic oozing can generally be arrested by drainage. Careful washing out of the peritoneal cavity (the peritoneal toilet,) especially if there has been the slightest escape of pus, is, of course, of the utmost importance.

As regards the treatment of pyosalpinx which has ruptured into the vagina Winter (85) argues that it should be more energetic than is generally adopted. Removal should be carried out if practicable and if not, freer drainage should be ensured. In most cases, however, as the exact diagnosis of the true nature of a pelvic abscess which has ruptured is almost impossible, removal is seldom attempted and free drainage, irrigation and stuffing of the cavity are all that can be aimed at with a view to curing the disease.

The question of whether or not both tubes should be removed is a vexed one which it is often difficult to decide. Having removed a pyosalpinx of one tube and finding the other apparently healthy or only slightly affected, some operators would remove it, others would not. Much would depend on the age and circumstances of the individual but there is certainly a tendency nowadays to let the patient run the risk of a second operation rather than sacrifice her possible fruitfulness. Tait strongly advocates removal of the ovaries and tubes on both sides.

The mortality is greater in salpingotomy for pyosalpinx than for non-cystic salpingitis but deaths are so infrequent that the operation is amply justified and infinitely safer than all other so called expectant methods of treatment.

Terrilon	14 cases	1 death
Routier	13 "	3 "
Terrier	4 "	1 "
Quenu	3 "	0 "

Pyosalpinx is not a common pathological lesion in Scotland. Dr.Croom, to whose statistics I have the privilege of access, has operated on only nine cases in the course of 540 abdomonal sections. Four of these formed distinct more or less rounded tumours and were thin-walled: five showed an earlier stage of the disease, the tube being simply considerably dilated and the walls rather thicker than normal. Of the four cases of true pyosalpinx, two were removed entire but the sac of the others was so delicate that it was ruptured in the course of the operation of removal. All the cases recovered.

Lawson Tait between 1880 and 1889 removed the uterine appendages in 474 cases for inflammatory diseases. Of these 173 were cases of pyosalpinx: of these 153 were double and 20 single. Of these 20, 12 were associated with hydrosalpinx of the other tube and three with haematosalpinx. 118 of the 474 were cases of hydrosalpinx and 7 of haematosalpinx.

Case XIII. Double pyosalpinx. Mrs.H. aet. 25

was admitted to Ward 28 on January 16th. 1894. She has had two children and her present symptoms date from the birth of the second, two and a half years ago.

She suffers from profuse, irregular and too frequent menstruation, pain in both iliac regions and in the back, severe premenstrual dysmenorrhoea for three days before each period, dyspareunia and abundant leucorrhoea. This second child was born at the seventh month and before the delivery for some weeks she had a very profuse yellow discharge and she also complained of frequent and painful micturition. Indeed, the probability is that the patient suffered from an acute attack of gonorrhoea. Ten days after labour she developed pain in the ovarian regions and this was so severe that she was confined to bed for a month. Under treatment she somewhat improved for a time but ever since, she has, from time to time, been laid aside on account of acute exacerbations of pain and has suffered from all her present symptoms.

On examination, the uterus was somewhat enlarged

and lying on each side, the Fallopian tubes were found excessively tender and distinctly distended. They were not specially fixed but the ovaries could not be differentiated from the tubal swelling. A diagnosis of double pyosalpinx was made and on Feb. 14th. 1894

Dr. Halliday Croom performed the operation of salpingo-oöphorectomy. On drawing up the appendages, which was fairly easily accomplished, in each case the tube was the first to appear at the abdominal wound, much distended and arching over the ovary as seen in *plate 34*. The left ovary seemed fairly healthy but the right contained a cyst about the size of a walnut. The patient has made an excellent recovery.

This case may be considered typical of the history and course of an infective affection of the Fallopian tubes as well as of the pathological appearances following a gonorrhoeal salpingitis.

The premature labour was probably the result of the venereal disease which the patient acquired (although this is not the rule) and after delivery the virus rapidly spread to the uterus and thence to the appendages, setting up a condition which ultimately neces-

sitated the operation of salpingo-oöphorectomy.

Macro- and micro-scopic drawings of these tubes are shown in Plates 33, 34, ^{35 & 36.} The lumen of the tube was markedly dilated and contained pus but for the most part the walls were hypertrophied except at one part where there was a distinct tendency to thinning. If the case had not been interfered with, probably, in course of time rupture would have occurred at this point.

Although a special preparation of some of the sections was made attempts to find gonococci proved unsuccessful.

Case XIV. Pyosalpinx. Mrs. W. aet. 26 was married in April 1892. Before that time she had enjoyed good health and had no menstrual disorder whatever. In November of the same year, when first examined, she complained of great pain in the right side, of menorrhagia, of leucorrhoea and said that intercourse was impossible on account of the pain produced. Per vaginam, the uterus on movement was tender and on

both sides, but especially the right, a distinct swelling of the appendages could be felt.

Her husband admitted that six months before marriage he had an acute attack of gonorrhoea and that up to within six weeks of the wedding he suffered from what he considered a slight and harmless gleet.

The patient was put under treatment but did not improve and indeed her sufferings at her period in January 1893 were greater than ever before. On examination soon after this, the swelling to the right and behind the uterus had assumed a more definite shape and a diagnosis of pyosalpinx was made.

This Dr. Halliday Croom removed and I show a drawing of the tube (Plate 30) which was fortunately removed without rupture. The operation was a difficult one owing to the fact that the tube and ovary were prolapsed into the Pouch of Douglas and were surrounded by many adhesions. The left tube, which was also removed was somewhat dilated and in a condition of acute purulent salpingitis.

The patient made an excellent recovery.

Case XV. By the kind permission of Professor Simpson I am able to here record the case of a very large pyosalpinx which he removed in November 1892 and to show a drawing of the specimen. (plate 40.))

The patient, J. W., age 32, unmarried, was admitted to ward 24 on October 31st. 1892. She had suffered during the last ten years from constant pelvic pain with frequent acute exacerbations especially just before and during the menstrual periods. The pain was so severe that she had at times been treated by her doctor for 'inflammation of the bowels.' The menstrual flow always continued from 10 to 20 days and the amount was excessive. The patient had borne no children and no history of an attack of gonorrhoea was elicited.

On physical examination, the abdomen was rather *distended* below the level of the umbilicus and in this region, especially in the right inguinal, a marked resistance and tenderness could be made out. Here, too, the percussion note was duller than elsewhere.

Per vaginam, the os uteri and the cervix were

nulliparous and normal. Through the anterior and lateral fornices a distinct resistance and tenderness, most marked on the right side, could be made out and behind the uterus, in the Pouch of Douglas, a soft bulging mass could be determined. Bimanually, this mass was found to be cystic but the body of the uterus could not be distinctly differentiated from the tumour, although it was probably lying anteriorly. Towards the right side, through the right lateral fornix a firmer more solid part could be distinguished but, on account of the pain produced, further examination was difficult.

On November 11th. 1892 Professor Simpson performed laparotomy and removed from the right side a tubo-
abscess
ovarian ~~cyst~~, (plate 41.) while from the left a huge pyosalpinx was removed intact. The patient made an excellent recovery.

This is an example of a very large purulent distension of a Fallopian tube. The drawing (Plate 40.) was made when the preparation had been nearly eighteen months in spirit so that it is considerably shrunken.

Unfortunately, the specimen had not been suitably prepared for microscopic sections but the walls now are about one tenth of an inch thick and in no part are they membranous. The internal surface is for the most part smooth but irregular. The shape of the tumor is well shown in the drawing.

There is in the Ward Journal no mention made of the supposed cause of the lesion. The patient does not seem to have been tubercular and there is no history of gonorrhoea. The vaginal orifice admitted two fingers but this may have been due simply to repeated examination before her admission to the Infirmary.

I show also a drawing of a section of the tubo-
abscess
ovarian ~~cyst~~ which was removed from the right side.

(Plate 41.)

XXXXXXXXXXXXXXXXXXXX

PART III.

HYDROSALPINX.

XXXXXXXXXXXXXXXXXXXX

HYDROSALPINX.

Bland Sutton (87) defines a hydrosalpinx as a "Fallopian tube distended with fluid in consequence of inflammatory occlusion of its abdominal ^{os} ~~set~~ium." From an anatomical point of view it is the oldest known of tubal affections. Nearly two centuries ago Abraham Cyprianus, (88) in a letter relating the history of a human foetus of 21 months shows a good illustration of hydrosalpinx. This lesion was found upon ^{the} ~~a~~ cadaver of a woman in whom sterility followed a complicated labour. According to Greig Smith (89) an analagous illustration is found in Dakker's Exercitationes Practicae. Leyden. 1695.

AETIOLOGY.

Many mild attacks of salpingitis, a mere catarrh of the tube, may subside without leaving any trace. However, it frequently happens when the inflammatory

process is so severe, while still non-purulent, that the ostium abdominale becomes occluded and as the uterine outlet is also, as a rule, blocked, the tube becomes distended by the secretion from the inflamed mucosa giving rise to the condition of hydrosalpinx which is, therefore, really in many cases a retention cyst.

The function of the normal cilia of the tube is to facilitate the passage not only of the ova but of the normal tubal secretion towards the uterus. Hence if these be destroyed by a previous salpingitis there is certainly a tendency to accumulation of fluid in the lumen of the tube.

There is also reason to believe that a hydrosalpinx may be a further stage of pyosalpinx, this being brought about by spontaneous destruction of the suppurative cocci and subsequent clarification of the pus. Bland Sutton (90) gives five reasons for this opinion. They are as follows;-

1. Hydrosalpinx is not found in acute cases.
2. In many chronic cases hydrosalpinx is found on one side of the uterus and a progressive

pyosalpinx on the other.

3. The ampulla of the tube will sometimes be dilated into a hydrosalpinx and the isthmus contain pus.
4. The fluid contained in a hydrosalpinx will sometimes be colourless, but the recesses of the tube contain caseous material, and
5. The dilated tube in hydrosalpinx may, as in pyosalpinx communicate with an enlarged ovarian follicle to form a tubo-ovarian cyst.

Mr Herbert Spenser (91) in the Brit. Med. Jour.

Dec. 15 1893 records a case of ovariectomy for a cystic tumour which was complicated by hydrosalpinx, and

Dr. Granville Bantock (92) in 1885 described a case in which he found along with a solid ovarian tumour a hydrosalpinx containing fluid like tea.

It is not commonly noted that hydrosalpinx is not infrequently associated with fibroid tumours of the uterus. Dr. Croom tells me that he has observed it in several cases and in one case which I myself had an

Case XVI.

opportunity of observing, and in which Dr. Croom removed the tubes and ovaries for a rapidly growing bleeding fibroid, there was a marked dilatation of the tube on the left side. (Plate 50.) Probably the displacement of the uterine end leads to inflammatory changes in the mucous membrane and, if this be sufficiently severe, the ostium abdominale becomes occluded and the tube distended by the exuded fluid. This condition may account for much of the pain in the side of which patients with fibroids complain. In the case which I observed, pain in the left side was a very distressing symptom and one of the indications for the operation of salpingo-ovariectomy which was performed and followed by absolute relief of the pain.

PATHOLOGY.*Hydro-salpinx*

A typical hydrosalpinx is bluish white in colour and sausage or legume shaped with blunted ends most marked at the fimbriated extremity. It is frequently curved upwards owing to the traction of the tubo-ovarian ligament and the ovary occupies the concavity of the tube. The situation of the ostium abdominale can sometimes be determined as a depression from which a series of ridges radiate.

The fluid is generally clear and colourless but, ^{owing} ~~due~~ to the presence of cholesterine, it is sometimes of a greenish tinge and if a certain amount of haemorrhage has taken place into the sac it is brownish in colour. The first effect of the continuous pressure of accumulating fluid on the walls of the tube is to stretch them and this leads to atrophy. The sac wall is a thin transparent membrane with delicate ridges representing all that remains of the longitudinal folds of the mucous membrane. (Plate ⁵⁷ ~~56~~) This itself is much atrophied and the epithelial lining is also destroyed,

there being no trace, except perhaps here and there, of the normal typical columnar ciliated cells.

As a rule a hydrosalpinx is not of large size. The walls are so atrophied that probably as the distension increases the fluid exudes through them into the peritoneal cavity. Fortunately being of a non-irritating character the fluid does no harm just as that of a ruptured parovarian cyst is readily absorbed by the peritoneum with impunity. The adventitious surrounding membranes, of any, are few, delicate and easily detached. It sometimes happens that the dilated tube is loculated.

(Plate 53.)

SYMPTOMS and SIGNS.

The existence of a hydrosalpinx is frequently discovered only on post-mortem examination. During life, the condition may give rise to no indications of pelvic disease but, on the other hand, one frequently finds associated with it all the symptoms of acute disease of the appendages. The patient complains of

the usual constant pain in the side, severe premenstrual dysmenorrhoea, menorrhagia and dyspareunia.

Much doubt is now thrown upon the possibility of what is called 'intermitting hydrosalpinx' or hydrops tubae prolapsus'. the occasional sudden escape of fluid through a temporarily patent ⁱⁿ uterine end, with disappearance of, or diminution in the size of, the tubal dilatation. It is much more likely that these discharges pass not through the cervix but by a vaginal fistula communicating with the cyst. As has been mentioned before, the discharge may be due to reflex contraction of the uterus causing expulsion of its contents.

Skene Keith (93) records a curious case in which intermittent gushes of a watery discharge from the uterus were supposed to be due to an intermitting hydrosalpinx but on removal of the tubes and ovaries, with a view to curing the troublesome symptom nothing was found in the appendages to account for the condition. This curious symptom is, therefore, not diagnostic of a serous dilatation of the Fallopian tube.

On physical examination, the signs resemble in

nearly every respect those of a pyosalpinx and, indeed in the majority of cases, the differential diagnosis is impossible. The character of the swelling is the same; an undilated portion of the tube next the uterus may or may not be felt, and fluctuation can only be rarely determined. The tumour may, just as the other forms of tubal dilatation, be situated to one or other side of the uterus in the normal line of the tube; it may be turned back or it may be prolapsed into the Pouch of Douglas. The amount of pain which a patient complains of on examination cannot be relied upon as a diagnostic symptom. It is said that in the case of pyosalpinx it is more severe. Besides differentiating it from the other forms of cystic tubes, hydrosalpinx has to be distinguished from ovarian cysts, pediculated fibroids, and prolapsed intestines, but it is not necessary to repeat what has already been said under the differential diagnosis of pyosalpinx. (Plate 45.)

The condition of ovarian hydrocele might be mistaken for that of hydrosalpinx. It differs from a tubo-ovarian cyst in that the tube, which may be somewhat distended, communicates with the hydrocele by the os-

tium abdominalis and not by an adventitious opening as is the case in a tubo-ovarian cyst.

In the Museum of the College of Surgeons there is a specimen which is of great interest in connection with the differential diagnosis of hydrosalpinx. It consists of two large legume shaped cysts which are believed by Sir Spencer Wells to be dilated Fallopian tubes. Bland Sutton, on the other hand, holds that they are distended horns of a bicornuate uterus and his reason for this belief is that the walls are thick and muscular. He points out that, when the Fallopian tubes are dilated, the walls invariably become thinned except in parts where the wall is infiltrated with inflammatory exudation while, when the uterus expands from any cause - an embryo-sac or retained mucus or a myoma - the walls hypertrophy. Bland Sutton therefore believes that this specimen is really one of hydrometra in a two horned uterus caused by some obstruction of the cervical canal with retention of the secretions. The physical signs might be very much those of hydrosalpinx but a careful examination of the walls shows

the true nature of the case. It is, therefore, possible that several specimens described as hydrosalpinx with thick walls are really examples of hydrometra in a bicornuate uterus.

PROGNOSIS and COURSE.

A hydrosalpinx, if left alone may give rise to no trouble or only to the usual menstrual disorders which are associated with inflammatory diseases of the appendages without affecting to any extent the general health. The cyst may rupture but this, as a rule, is followed by no untoward result; the fluid being non-irritating is rapidly absorbed by the peritoneum. Not uncommonly, there is associated with the dilatation a cyst of the broad ligament and a communication may be formed between the two. Again, fistulae into the rectum or bladder may be found but these are rare and certainly much less common than in the case of pyosalpinx as the inflammatory adhesions to these organs which may take place, are so much less intimate and

fixed. It has been supposed that the condition of 'intermitting hydrosalpinx' is due to an opening of the tubes into the vagina. A cyst of the ovary may communicate with a serous dilatation of the tube giving rise to a tubo-ovarian cyst and it is possible that many recorded cases of very large hydrosalpinx are really ovarian cysts which have been adherent to and opened into the Fallopian tube. In these cases the tube is not dilated but merely lengthened. (Plate 45)

The condition of hydrosalpinx indicates that the acute inflammatory process has ceased but it is quite possible that re-infection should take place leading to suppuration and the conversion into a 'pus tube.'

Effusion of blood may also occur into the sac so that frequently mixed forms of tubal dilatation are found. Hence, if rupture occurs, and even only a small amount of septic pus be present the accident is attended with danger.

It has been shown especially by Bland Sutton who has made special observations on the post-mortem condition of the tubes of prostitutes, that if the patient survive the dangers associated with existence of an

inflamed cystic tube the diseased parts after a time begin to atrophy so that the Fallopian tubes may be represented by mere impervious cords.

In this way spontaneous cure of a hydrosalpinx may occur. Sutton (94) in 1892 showed at the Obstetrical Society of London a specimen in which one tube was much dilated with serous fluid and on the point of rupture while the other tube was atrophied and cord-like, the hydrosalpinx on this side having probably ruptured some time previously.

A few cases are recorded where twisting of the pedicle of a hydrosalpinx has occurred, just as it frequently does in that of ovarian cysts. One occurred in the practice of Henry Morris and is recorded by Bland Sutton (95). Veit (96) also mentions one in a paper in Centralblatt für Gyn. May 30. 1891.

In inflammatory conditions of the Fallopian tubes the closure of the ostium abdominale is a most important factor in the protection of the peritoneum. But Alban Doran (97) especially has shown that even mild

forms of salpingitis may set up a condition of what is called hydroperitoneum. He defines it "as a collection of fluid in the peritoneal cavity which cannot be referred to any tangible organic disease", that is to say, to any organic disease of the heart, liver or kidneys.

Doran considers that the ascites is due to the constant irritation of inflammatory products dripping from an unobstructed ostium abdominale in mild types of salpingitis. The condition is not a common one but is of great clinical importance and deserves careful investigation.

Case XVI. Ruptured Hydrosalpinx without
ill effects.

Mrs. J. aet. 35, married, with three children, came to Ward 28. in September 1893 complaining of premenstrual dysmenorrhoea, constant pain in the left side, leucorrhoea and menorrhagia.

On pelvic examination, it was found that she suf-

ferred from severe endometritis with enlargement of the uterus and on the left ~~side~~^{side} a pear shaped swelling with its apex next the uterus could be distinctly felt. The case was looked upon as a most marked example of either hydro or pyosalpinx - so marked that one or two students were asked to examine it as a typical case. The patient could not remain in the ward that day but promised to return in a fortnight, which she did.

On admission she said that for some days after the previous visit the pain in the side was much aggravated but that then it almost suddenly disappeared. On examination the uterus was as before but the distinct tubal swelling had vanished leaving only a slight fulness in the fornix. The patient was at once put to bed and carefully watched but no untoward symptoms appeared. After a course of hot douching and vaginal packing the operation of curettage was performed with a view to curing the endometritis which still existed and five weeks after admission the patient left the ward apparently well.

That this was a case of rupture of a hydrosalpinx there can be but little doubt. The swelling had all

the characters of such a dilatation and did not resemble a parovarian cyst which was the only possible alternative diagnosis.

The examinations to which she was subjected on her first visit to the Infirmary together with the fatigue of the journey from and to the country were no doubt the immediate cause of rupture.

TREATMENT.

The great difficulty in the treatment of hydrosalpinx is the diagnosis. There are, no doubt, cases which are discovered accidentally^{al} and in which a distended tube gives rise to absolutely no symptoms whatever. Under these circumstances, if one were certain that the fluid was non-purulent and harmless, it might be justifiable to leave the case alone but, unfortunately, it is practically impossible to be sure of such a diagnosis. Rupture would probably not be followed by serious results but there is also a risk - although it is an infrequent occurrence - of the cyst becoming purulent.

If, on the other hand, the pain, discomfort and general deterioration of health were great, the abdomen should be opened without delay and the hydrosalpinx removed. Treatment of tubal distension, by dilatation and curettage of the uterus has been discussed on a previous page and is probably in the majority of cases not only hopeless but dangerous. To tap the swelling per vaginam or to attempt to cause its disappearance by electricity, by baths or by general treatment are all, as a rule, equally unsatisfactory.

Apostoli, (98) however, in the British Medical Journal Vol. 1. 1888 p, 998 records two cases of hydrosalpinx which he successfully treated by galvano-puncture.

The operation of oöphoro-salpingotomy for hydro- is not attended with such difficulty as that for pyo-salpinx. As a rule, the tumor is not adherent to neighbouring organs or, if so, the adhesions are easily separated. Care should be taken not to rupture the tube in drawing it up to the surface but it is often difficult to avoid the accident as the walls are so thin.

The steps of the operation are the same as those

for the removal of a "pus tube"; the risks, on account of the non-irritating character of the fluid are less and the mortality is not so high. If, after the removal of a hydrosalpinx from one side, the other ovary and tube were found healthy one would be more inclined to leave them, if the woman were young, than in the case of purulent dilatation of the tube.

In some cases of hydrosalpinx Marten and Skutsch (99) have performed an operation to which the latter gave the name of salpingostomy. The nature of the fluid is first ascertained by an aspiratory puncture and if serous, instead of extirpating the tube, Skutsch opens up the occluded fimbriated extremity and allows the fluid to escape. A portion of the sac wall, about half an inch wide, is then cut away and the mucous and serous lining brought together by fine silk sutures. In this way a new ampulla is formed and in order that the tube should be permeable a sound is passed through it into the uterus. Skutsch proposes that it might even be better to suture the new ampulla to the ovary.

The operation of salpingostomy has not been adopted by many operators. It is longer and more difficult than salpingotomy and it has been found that in its object, viz. that of restoring the function of the tube, it has failed. Marten has done seven cases but has not observed a single case in which pregnancy followed. The tube may be made permeable by the operation but it is impossible to restore the structure of the organ and therefore probably not the function of it.

Case XVII.

HYDROSALPINX.

Mrs. T. aet. 36 for some years - ever since her first and only child was born after which she said she was acutely ill - had suffered from well marked symptoms of disease of the uterine appendages.

On examination, lying to the right and behind the uterus, there was a fairly hard, fixed, sausage-shaped swelling rather smaller at one end than the other.

A diagnosis of hypertropic^h salpingo-ovaritis was made and, as under a prolonged trial of the usual

treatment the symptoms did not subside it was resolved to remove the annexa by abdominal section.

On Dr. Halliday Croom cutting down the true nature of the case became apparent. Turning back acutely from the uterine horn into the Pouch of Douglas was a cystic tumor about the size of two fingers which on closer examination proved to be a dilated Fallopian tube, under which the ovary, also enlarged, was found adherent to the oviduct. These were removed and as the annexa on the left side also showed a condition of salpingo-ovaritis they were accordingly extirpated as well. The dilated Fallopian tube had thin walls and contained a clear watery fluid; there being no trace of pus.

A drawing of the tube is shown in Plate 42.

Under the microscope, there were only here and there any signs of the normal epithelial covering of the mucosa which consisted chiefly of an imperfect embryonic connective tissue while the muscular coat was much attenuated and the muscular fibres regenerated. The slide was unfortunately broken so that I am unable to show a drawing of the microscopic specimen.

Case XVIII.HYDROSALPINX.

Plate 44 is a drawing of a hydrosalpinx removed from a lady who had been married for 7 years, was sterile and who for most of that time had suffered from symptoms of disease of the uterine appendages.

The physical signs consisted of a tender elongated swelling lying transversely across the posterior aspect of the fundus uteri which was somewhat retroverted.

As for years the usual antiphlogistic measures for an inflammatory affection of the uterine annexa had frequently at intervals been tried without success Dr. Halliday Croom removed them by abdominal section. The operation was an easy one and attended with the best results.

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PART IV.

HAEMATOSALPINX

and

other effusions of blood into the

Fallopian tube.

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Haematosalpinx
and other effusions of blood
into the tube.

Much confusion exists as to the exact meaning of the term. Some authorities include under this name all effusions of blood into the Fallopian tube, others limit it to those cases where there is marked cystic dilatation of the oviduct, while others exclude those cases which are due to the rupture of a tubal gestation. As a rule, the term haematosalpinx is considered to imply that the tube is distinctly cystic, the walls being dilated and thinned and the condition more or less permanent, but there is no doubt that haemorrhages do take place into the lumen of a non-dilated tube with thickened walls, the condition being transitory and the effused blood rapidly disappearing.

Normally, during menstruation, in many cases a certain though small amount of blood is effused into the lumen of the Fallopian tube just as into the uterine cavity. Many operators, including Spencer

Wells, Tait, Poncet, Prewit and Migrew, have noted that after an ovariectomy, when the stump is treated extra-peritoneally either by ligature or by the clamp, it is not uncommon to have an oozing of blood from the cut surface at the menstrual period. This physiological haemorrhage may not universally occur but it is certainly frequent. Anything which increases the normal congestion of the genital tract which takes place at the menstrual epoch will predispose to the condition. As a rule, when the tubes are healthy the blood will pass into the uterus and give rise to no trouble; if the haemorrhage is more pronounced it may clot and give rise to indefinite symptoms until it is reabsorbed; if excessive, the blood will probably escape into the peritoneal cavity giving rise to a retro-uterine haematocoele.

In the course of an ordinary inflammatory affection of the tube - even in catarrhal inflammation - it is not uncommon to have a more or less marked apoplexy into the lumen. Indeed during merely an irregular

menstruation, especially in plethoric patients, a similar condition may occur. The symptoms, however, are indefinite and are usually attributed to simply pelvic congestion. They rapidly pass off as the blood escapes into the uterus or if it clots is speedily reabsorbed. The lesion is, therefore, not easily recognised and none but the symptoms of a congestive condition of the tube are detected.

In true haematosalpinx, however, the tube is distinctly dilated and a sac just as in pyo- and hydro-salpinx exists.

AETIOLOGY.

The aetiology of this condition is full of interest and on the subject much difference of opinion exists. Some authorities hold that a tube is found distended with blood only in cases of arrested tubal gestation; others believe that it may occur under other circumstances. Those who hold the first view admit that frequently apparently nothing but a blood

clot is found in the oviduct but they argue that in such cases the foetus, after its death, has been absorbed and that if careful search is made traces of chorionic villi will be found. The history of the case too, is of the utmost importance. Those who believe that haematosalpinx may be produced by causes other than tubal gestation lay stress on the clinical history of many cases and hold that on the most careful pathological examination frequently no trace of a pregnancy can be discovered.

No doubt, many cases of ruptured tubal gestation have been described as simple haemorrhages into the lumen of the tube. This was especially so before the clinical and pathological features of extra-uterine pregnancy were carefully studied as in recent years. Thus, Pueck (100) in 1859 recorded two cases of fatal haemorrhage from the tube without assigning any cause but one recognises from the history that the cases were almost certainly examples of ruptured ectopic gestation.

Dr. Cullingworth (101) in a most valuable paper

in the St. Thomas's Hospital Reports Vol. 21 records seventeen cases and discusses the aetiology of effusions of blood into the Fallopian tube, each case having been operated on and the specimen carefully examined.

Cullingworth endeavours to determine two points (1) the proportion of cases in which the effusion of blood in the Fallopian tube is the result of tubal gestation and (2) the proportion of cases in which a diagnosis of tubal gestation based on the clinical history is confirmed by the discovery, amongst the effused blood, of distinct remains of an ovum.

In reference to the first object of enquiry the cases are divided into four groups. In group 1, there are two cases in which the evidence of tubal gestation is complete and a distinct ovum was found amongst the effused blood. In group 2, there are 10 cases in which the clinical history points unmistakably to tubal pregnancy and yet no traces of an ovum were detected in the specimen. In group 3, there ^{are} ~~were~~ two cases in which the clinical evidence of tubal gestation was doubtful or incomplete and in which on pathological

examination no trace of an ovum was found. In group 4, are three cases in which there was evidence pointing to a cause for the effusion of blood other than tubal gestation. That is to say, in two cases tubal gestation was absolutely proved to be the cause of the haemorrhage in the tube, was almost certainly the cause in ten cases, was possibly the case in two others, and in three others there was reason to believe the cause was not an extra-uterine pregnancy. Of these three last mentioned cases one occurred in the course of a chronic salpingitis, one co-existed with cancer of the ovary and one was a haemorrhage into a tube already cystic and containing mucus.

In reference to the second subject of enquiry Dr. Cullingworth observed that in ten of the seventeen cases the clinical history pointed strongly to tubal gestation as the cause and yet on examination by an expert no trace of an ovum could be found. In only two cases was the diagnosis absolutely confirmed by microscopic examination.

Cullingworth concludes that it is quite possible for a case to be one of apoplectic ovum and yet no products of conception be found but that it is also possible to have a tube distended with blood from other causes.

Bland Sutton (102) advocates the restriction of the term, haematosalpinx, to those cases in which the effusion of blood is due to other causes than tubal gestation. Cullingworth, however, considers it better to apply it to all effusions whatever their course.

Bland Sutton's experience is that practically all tubes dilated from haemorrhage are gravid and he points out that only two conditions lead to tubal distension with an unclosed ostium - the retention of an impregnated ovum and a growth within the tube.

Further, in those cases of tubal pregnancy in which closure has occurred a difference in the mode of occlusion can be detected. When due to a salpingitis there is ample evidence of the inflammatory changes which have caused it.

Into the very wide subject of tubal pregnancy I do not propose to enter but its relation to haemato-salpinx must be discussed as no doubt it is the most frequent cause of effusion of blood into the Fallopian tubes. A salpingitis resulting in the destruction of the ciliated epithelium is said to be one of the most common causes of tubal gestation. Lawson Tait says, "the uterus alone is the seat of normal conception; that as soon as the ovum is affected by the spermatozoa it adheres to the mucous surface of the uterus; that the function of the ciliated lining of the Fallopian tube is to prevent spermatozoa entering there and to facilitate the progress of the ovum into the proper nest; further, that the plications and crypts of the mucous membrane lodge and retain the ovum either till it is impregnated or till it dies or is discharged."

If that is the normal state of affairs it is concluded that as the result of a desquamative salpingitis the ovum is not carried into the uterus but becomes impregnated and lodges in the oviduct.

There are, however, objections to this theory. When

inflammatory action is so severe as to destroy the tubal epithelium the abdominal ostium will also probably be closed and, therefore, passage of the ovum from the ovary is impossible. Again, many specimens of early tubal gestation, having been carefully examined have revealed no trace of salpingitis or destruction of the epithelium whatever.

An impregnated ovum may be situated in any part of the tube, and various changes are at once set up. A marked hypertrophy and an increased vascularity takes place - but there may be a thinning of the walls in parts - and about the end of the eighth week the abdominal ostium is closed. The ovum itself grows and becomes fixed by the development of chorionic villi and ultimately of the placenta which attaches it to the tubal mucous membrane.

Whilst the ovum is adherent to the tube only by villi, it is not uncommon to have haemorrhage occurring among the villi on account of some slight dislodgement of the ovum. The effusion of blood may be slight but if well marked the death of the foetus, the formation

of a tubal mole and possible disastrous results to the patient result. This accident generally occurs between the fourth and eighth week. The haemorrhage may occur only among the membranes or the whole ovum may be occupied by blood and very soon the blood clot becomes hard and laminated. It is those latter which are supposed to be cases of haematosalpinx from other causes than pregnancy and whose true nature are determined only on careful microscopic examination resulting in the detection of chorionic villi or a trace of the embryo. These tubal moles vary in size according to the date of a pregnancy reached and their formation is a common cause of what is known as tubal abortion or of rupture of the sac. When recent a tubal mole or apoplectic ovum is externally dark red in colour (Plate 54) but after some weeks it becomes yellowish on the surface and quite hard. Small specimens are circular while larger ones are ^{ovoid} in shape and they rarely exceed the size of a Tangerine orange.

As a rule a central cavity with a smooth lining (the amnion) can be detected but frequently the cavity is early destroyed so that no embryo may be observed

or it may have escaped if the mole has ruptured.

The microscope may reveal the existence of chorionic villi or, which is more trustworthy, traces of the embryo itself. On section the villi are seen in clusters and each has an external lining of cubical epithelial cells - in large ones there may be a double layer - enclosing a mass of irregularly shaped cells.

The great majority of tubal gestations rupture; the formation of a tubal mole is one of the causes on account of the thinning of the walls which takes place. This rupture may occur into the peritoneal cavity or between the layers of the broad ligament. However, it occasionally happens that an apoplectic ovum- the pregnancy, of course, being ended - shrinks, becomes quiescent and gives rise to no further trouble. It sometimes happens too, that tubal abortion takes place in which case no rupture of the Fallopian tube is found.

It has been shown that in tubal pregnancies the abdominal ostium is not closed till about the sixth

or eighth week and, therefore, the ovum may escape into the peritoneal cavity through the fimbriated extremity only within the first two months.

Associated with the discharge of the ovum there is a copious haemorrhage into the abdominal cavity which may result even in death. No doubt this is the origin of many ^{fatal} cases of haematocoele and can only be detected by very careful examination of the clots removed.

Even though the ovum itself does not escape profuse haemorrhage from the tube may take place.

Bland Sutton (103) records an interesting case of this kind in which a large haematocoele and an abundant effusion of blood into the tube were due to the presence in the lumen of a small apoplectic ovum which had been impregnated only three or four weeks.

The records of many other cases point to the same origin of an intraperitoneal haemorrhage and to a similar explanation of the condition found in the tube commonly called haematosalpinx. Hence, it is seen that the haemorrhage into the peritoneal cavity associated with an early tubal gestation may be the result of rupture of the tube or of an escape from the tube

through the ostium abdomale. It is also held that the abortion and haemorrhage may occur into the ovarian sac which would account for those cases described as ovarian pregnancy the possibility of which is denied by most observers.

When the ovum survives the rupture of the tube between the layers of the broad ligament the sac continues to develop until what is called 'secondary rupture' occurs intra - or extra-peritoneally but as this sac does not consist of the distended tube alone it has no special reference to the present subject.

AETIOLOGY of TRUE HAEMATOSALPINX.

As regards the causes of true haematosalpinx or effusion of blood into the Fallopian tube, not the result of an extra-uterine gestation, it has already been pointed out that it may occur in a minor degree in the course of a catarrhal salpingitis or an irregular menstruation.

Dr. Johnston (104) in 1880 recorded the case of

Miss Neilson who died from the rupture of a varicose vein in the Fallopian tube. The rupture was the result of straining during a prolonged and severe attack of vomiting.

Dr. Halliday Croom (105) in a paper on the subject remarks, that haematosalpinx as an unimportant complication in abdominal surgery seems to be not infrequent. Writing in 1891 he says that out of above 400 cases of abdominal section he has met with the slighter form five times, - twice in removing the ovaries for bleeding fibroids, once in connection with a small ovarian tumour, and twice in ovarian tumours with twisted pedicle. On the other hand, in four cases the presence of a distinct tumour, which afterwards proved to be a haematosalpinx, was in itself the indication for the operation. The first case is one in which practically all the symptoms and signs of a tubal gestation existed and yet on very careful examination by Dr. Sims Woodhead no trace of pregnancy could be found. This is one of those cases which some authorities would consider was really an extra-uterine pregnancy in which

the direct pathological evidence had been destroyed or missed and is exactly parallel to the ten cases recorded by Cullingworth and referred to on a previous page. Dr. Cullingworth looks upon these as examples of gravid tubes; Dr. Croom, however, from the fact that no decidual cells or chorionic villi were found does not.

Paul Ruge (106) records a similar case and, in opposition to Veit (107) who also saw the specimen, holds that as no trace of the characteristics of a pregnancy could be found it was one of true haematosalpinx.

It has been said that massage of the pelvic organs may be the cause of an effusion of blood into the Fallopian tubes. Duhrssen (108) affirms that he has seen several such cases.

Haematosalpinx is occasionally associated with bleeding fibroids.

Dr. Halliday Croom (105) records an interesting example of this. A woman, aet. 32, sterile, was sent to the hospital because of irregular haemorrhages extending over two years. Local examination showed a

slightly enlarged uterus of somewhat irregular shape. On the left side there was a soft fluctuating tumour about the size of an orange. On removal it proved to be a well marked haematosalpinx. The point of interest was that just at the junction of the Fallopian tube with the uterine cornu there was a small fibroid tumour blocking up the exit of the tube and as the fimbriated extremity was closed and club shaped, the cause of the haematosalpinx was obvious. The haemorrhage in this case no doubt was derived directly from the capsule of the tumour but in many cases in which haematosalpinx is found associated with uterine fibroids, it is due to the haemorrhagic metrosalpingitis which accompanies the development of the uterine tumour.

In removing ovarian tumours with twisted pedicles it has occasionally been observed that the tube was much distended by effused blood, due, no doubt, to the obstruction of the vessels causing congestion, exudation and extravasation with rapid enlargement of the tube.

Cullingworth (101) records a case in which haematosalpinx was associated with carcinoma of the ovary and general pelvic inflammation and also one in which an effusion of blood occurred into the right tube while

the left was occupied by an impregnated ovum.

Atresia of the genital tract is a well recognised factor in the causation of haematosalpinx.


Fuld (109) has collected 66 cases of atresia and in 39 of them haematosalpinx existed. It has also been asserted that blood may be found in the Fallopian tube on account of reflux of the menstrual fluid from the uterus into the lumen. These cases are rare and doubtful.

Under still one other condition may effused blood be found in the lumen of the oviduct. It is a transformation from another form of tubal dilatation. When the walls of a pyosalpinx thicken, instead of thinning while they dilate, haemorrhage is apt to occur into the cavity of the sac so that the nature of the case is altered. Sometimes the change from pyo- to haematosalpinx is a direct one; sometimes there is an intermediate condition of hydrosalpinx.

PATHOLOGY.*Mixed Anatomy*

The pathological appearances of an effusion of blood into the Fallopian tube - an apoplectic ovum - the result of a pregnancy have already been described.

The size of a true haematosalpinx does not as a rule exceed that of a medium sized pear but they may be larger and Lawson Tait has described one that extended as high as the level of the umbilicus and contained several litres. In such a case, however, it is possible that besides the effusion into the tube there had been an intraperitoneal haematocoele which had become encysted. The sac is thin in parts, thick in others and here and there the muscular fibres are hypertrophied as in pyosalpinx. When due to the retention of menstrual fluid, the contents are thick and chocolate coloured but when from other causes they consist of pure blood or a mixture of watery fluid and blood or of pus and blood. The whole mass may be clotted or coagula may be found in layers on the walls or floating free in the fluid. Under the microscope irritative changes similar to those found in pyosalpinx



are found but to a less degree. Fusiform cells in the mucous membrane are unusually abundant and these seem to form layers which project into the cavity of the sac. On the top of these folds the epithelial lining has disappeared but in the crypts a distinct, though modified, epithelial covering may exist, and underneath this very often a dense network of capillaries is found.

SYMPTOMS and SIGNS.

In the case of true haematosalpinx these are extremely indefinite and the diagnosis is difficult; the presence of an ovum in the tube, on account of the definite clinical history, can occasionally be determined with more certainty and cases are recorded in which the condition has been made out before rupture. Nevertheless, many authorities, including Tait, hold that the diagnosis of a tubal gestation before rupture is impossible while others, as Aveling and Barnes, hold

that it is easier than that of an early uterine pregnancy.

Be that as it may, to diagnose the presence of a recently impregnated ovum in the tube may be possible but that we should determine that a haemorrhage had occurred into the sac - (an apoplectic ovum) - without rupture of the tube is highly improbable. As guides, one has the usual symptoms and signs of extrauterine gestation, general indications of pregnancy as enlargement of the breasts, suppression of menses and morning sickness, the displacement of the uterus to one side by a cystic tumour which gradually grows, irregular haemorrhages, the passage of decidua and the existence of constant, and also frequent ^{acute} paroxysms of, pain in the side. When haemorrhage occurs into the cavity of the ovum or into the Fallopian tube outside the sac the patient will probably have a paroxysm of severe pain with faintness, perhaps vomiting and some slight collapse but these symptoms may occur even when there is no haemorrhage. An early extra-uterine pregnancy is felt bimanually as a cystic gradually growing tumour

generally displacing the uterus. It is usually situated to one or other side of that organ but may be found in the Pouch of Douglas. Such have been diagnosed as cases of retroverted gravid uterus. The swelling is always fixed, a pulsation is frequently felt in the fornix beneath it and, with the aid of the stethoscope, a souffle may be heard over the tumour.

When blood has been effused and has not escaped from the tube the clinical picture does not differ from the above unless, indeed, the embryo having died, the ovum and blood clot have shrunk and hardened when the tumor will be felt as a firm solid-like rounded swelling.

True haematosalpinx forms a cystic swelling which can be felt bimanually to one or other side or, occasionally, behind the uterus. It has no features that especially distinguish it from other forms of tubal dilatation. In arriving at a diagnosis the history is of importance and the knowledge of the presence of any condition which might give rise to it. At the onset, the patient suffers from severe pain in the side with

a mild degree of collapse and afterwards she may have all the symptoms of inflammatory disease of the uterine appendages - premenstrual dysmenorrhoea, menorrhagia, dyspareunia. On the other hand, it is quite possible that the patient should enjoy the best of health and be unaware of the existence of the condition. In haematosalpinx Puech has sometimes noticed a constant dribbling of small quantities of blood instead of real menses; this is what is sometimes called 'amenorrhoea distilane'. It, however, occurs in other conditions such as endometritis.

What has already been said of hydro-and pyosalpinx with regard to intermittent discharges into the uterus also applies to this form of tubal dilatation and on the whole the symptom is not reliable.

DIFFERENTIAL DIAGNOSIS.

Hydro-and Pyosalpinx are usually double whereas haematosalpinx is generally single. Those who believe that all effusions of blood into the Fallopian tube

are the result of a gestation, point to this fact as strong evidence in favour of their view. Pyosalpinx usually is more or less fixed while the other two may be free.

The history of septic poisoning or of symptoms of inflammatory disease leads one to suspect that the sac contains inflammatory exudation and especially if there is a history of gonorrhoeal infection the case is probably one of pyosalpinx. In haematosalpinx the onset is, as a rule, more sudden than in the case of the other forms of tubal dilatation. Fistulae from which pus exudes indicate the true nature of the case. The diagnosis of haematosalpinx from an early extra-uterine gestation is, from the physical signs alone, almost impossible and much depends upon the history of the case. It is, however, quite certain that tubal pregnancies are always fixed but in some cases a tube distended with blood not the result of tubal pregnancy is also adherent to surrounding parts, as for example, when it occurs in the course of a salpingitis. The signs of pregnancy, intermittent haemorrhage and the

passage of deciduae lead one to suspect the existence of the one rather than of the other. If, associated with atresia of the genital tract, a cystic dilatation of the Fallopian tube is found the nature of the case is evident, it being a marked form of haematosalpinx. The distended horn of a bicornuate uterus simulates in many respects a dilated Fallopian tube.

COURSE.

A tube distended with blood is very apt to rupture either into the peritoneal cavity or between the layers of the broad ligament. This, as has already been described, is especially apt to occur in cases where the haemorrhage is the result of tubal gestation and, further, if the tube does not rupture and the abdominal ostium is patent, blood may escape through the opening giving rise to many otherwise unexplainable cases of haematocele. Rupture is followed by the usual, sometimes fatal, symptoms of internal haemorrhage with pain

and collapse. When the bleeding has occurred extra-peritoneally the effusion is limited and the general symptoms are less in degree. Along with the formation of a haematocoele there is frequently a discharge of blood from the uterus.

The course of true haematosalpinx depends very much upon the cause. Sometimes, though rarely, just as in the case of an apoplectic ovum, the blood, after coagulation, may shrink and to a certain extent be absorbed, it may remain quiescent or on the other hand it may rupture with serious results. The sac is not so apt to become adherent to neighbouring pelvic organs as a pyosalpinx so that fistulae are not commonly found. When the dilatation of the tube is due to the retention of menstrual fluid on account of atresia, the removal of the cause may be followed by subsidence of the tubal swelling and Aman (110) relates a most interesting case of this. If, however, the proximal end of the tube is not patent the haematocolpos and haematometra may, after removal of the obstruction, disappear but the cystic condition of the tube remains.

Several cases of this are recorded.

Dr. Halliday Croom (105) mentions one in which he operated on a case of atresia hymenalis with retention of menses but a fulness continued in the left iliac fossa and four years later by abdominal section he removed a large haematosalpinx, the proximal end of the tube being closed and atrophied.

Again, it sometimes happens that before the operation for atresia the tubal swelling suddenly disappears, without any external discharge, with symptoms of collapse &c. Rupture has occurred probably into the peritoneal cavity and is an indication for instant laparotomy as well as relief of the obstruction to the normal outflow from the uterus.

Occasionally, an effusion of blood may suppurate owing to the introduction into the sac of septic cocci which reach it probably through the lymphatics and the case assumes all the features of a pyosalpinx.

On the other hand, the blood may be replaced by a serous watery fluid giving rise to the condition of hydrosalpinx.

TREATMENT.

As a general rule, it may be said that a haemato-salpinx or other effusion of blood into the tube should, whenever the lesion is determined, be removed by abdominal section. If a diagnosis of tubal gestation be made before rupture - a condition which is almost certain to lead to effusion of blood into the tube and probably rupture - laparotomy is at once indicated. If the effusion has occurred simply into the sac of the ovum and the symptoms pass off, it would, in some cases, be justifiable to leave the case and hope for gradual shrinking of the clot and no further trouble.

On the other hand, when the haemorrhage has occurred into the peritoneal cavity and the origin of the effusion is evidently in the tube salpingotomy should at once be performed. There are, however, cases in which the rupture occurs between the layers of the broad ligament and the symptoms of internal haemorrhage are slight and soon pass off. Under these circumstances, the effusion of blood is limited and will

gradually be absorbed or shrink so that operative interference may be at least deferred until a further indication offers itself.

Case XIX. During the past summer I had an opportunity of observing such a case. A woman aet. 35 suddenly one night had an attack of severe pelvic pain with collapse which however passed off after some little time.

On enquiring into the history it was found that she had all the symptoms of an extra-uterine gestation and on vaginal examination a soft tender swelling was felt on the left side of the uterus and the fulness could also be felt in the iliac fossa. Deciduae were passed and gradually the symptoms disappeared. Six months later, the only indication of what was probably a rupture of a tubal gestation between the layers of the broad ligament was a slight resistance in the left vaginal fornix.

The great difficulty in all such cases is the diagnosis as it is by no means easy to determine the

cause of the haemorrhage or where it has occurred.

That a haematosalpinx should be tapped through a vaginal fornix has been proposed by several authorities and this method has been followed by success in the hands of some. There is, however, a great danger of injuring the intestines, of setting up suppuration in the sac or of causing a haematocoele into the peritoneal cavity.

Dr. Halliday Croom (105) records a case in which he aspirated the tumour and for a time the result was satisfactory but the condition of haematosalpinx returned eighteen months later with accompanying symptoms and was then removed by abdominal section. Puncture through the abdominal wall is also unsafe and unsatisfactory.

When the distension of the tube is due to retained menses from atresia the cause should, of course, be removed when the haematosalpinx may or may not subside according as the uterine end of the tube is patent or closed. If it does not disappear the operation of salpingotomy should be performed. Laparotomy

and removal of the tube is sometimes suddenly indicated by the speedy disappearance of the swelling of the tube without an outward discharge of blood. Rupture into the peritoneal cavity has probably occurred with the usual symptoms and demands instant operation.

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